

NBS TECHNICAL NOTE 649

A UNITED STATES
DEPARTMENT OF
COMMERCE
PUBLICATION



THE STANDARDS OF TIME AND FREQUENCY IN THE U.S.A.

QC
100
U5753
no. 649
1974
c.2

U.S.
DEPARTMENT
OF
COMMERCE

National
Bureau
of
Standards

NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards¹ was established by an act of Congress March 3, 1901. The Bureau's overall goal is to strengthen and advance the Nation's science and technology and facilitate their effective application for public benefit. To this end, the Bureau conducts research and provides: (1) a basis for the Nation's physical measurement system, (2) scientific and technological services for industry and government, (3) a technical basis for equity in trade, and (4) technical services to promote public safety. The Bureau consists of the Institute for Basic Standards, the Institute for Materials Research, the Institute for Applied Technology, the Institute for Computer Sciences and Technology, and the Office for Information Programs.

THE INSTITUTE FOR BASIC STANDARDS provides the central basis within the United States of a complete and consistent system of physical measurement; coordinates that system with measurement systems of other nations; and furnishes essential services leading to accurate and uniform physical measurements throughout the Nation's scientific community, industry, and commerce. The Institute consists of a Center for Radiation Research, an Office of Measurement Services and the following divisions:

Applied Mathematics — Electricity — Mechanics — Heat — Optical Physics — Nuclear Sciences² — Applied Radiation³ — Quantum Electronics³ — Electromagnetics³ — Time and Frequency³ — Laboratory Astrophysics³ — Cryogenics³.

THE INSTITUTE FOR MATERIALS RESEARCH conducts materials research leading to improved methods of measurement, standards, and data on the properties of well-characterized materials needed by industry, commerce, educational institutions, and Government; provides advisory and research services to other Government agencies; and develops, produces, and distributes standard reference materials. The Institute consists of the Office of Standard Reference Materials and the following divisions:

Analytical Chemistry — Polymers — Metallurgy — Inorganic Materials — Reactor Radiation — Physical Chemistry.

THE INSTITUTE FOR APPLIED TECHNOLOGY provides technical services to promote the use of available technology and to facilitate technological innovation in industry and Government; cooperates with public and private organizations leading to the development of technological standards (including mandatory safety standards), codes and methods of test; and provides technical advice and services to Government agencies upon request. The Institute consists of a Center for Building Technology and the following divisions and offices:

Engineering and Product Standards — Weights and Measures — Invention and Innovation — Product Evaluation Technology — Electronic Technology — Technical Analysis — Measurement Engineering — Structures, Materials, and Life Safety⁴ — Building Environment⁴ — Technical Evaluation and Application⁴ — Fire Technology.

THE INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY conducts research and provides technical services designed to aid Government agencies in improving cost effectiveness in the conduct of their programs through the selection, acquisition, and effective utilization of automatic data processing equipment; and serves as the principal focus within the executive branch for the development of Federal standards for automatic data processing equipment, techniques, and computer languages. The Institute consists of the following divisions:

Computer Services — Systems and Software — Computer Systems Engineering — Information Technology.

THE OFFICE FOR INFORMATION PROGRAMS promotes optimum dissemination and accessibility of scientific information generated within NBS and other agencies of the Federal Government; promotes the development of the National Standard Reference Data System and a system of information analysis centers dealing with the broader aspects of the National Measurement System; provides appropriate services to ensure that the NBS staff has optimum accessibility to the scientific information of the world. The Office consists of the following organizational units:

Office of Standard Reference Data — Office of Information Activities — Office of Technical Publications — Library — Office of International Relations.

¹ Headquarters and Laboratories at Gaithersburg, Maryland, unless otherwise noted; mailing address Washington, D.C. 20234.

² Part of the Center for Radiation Research.

³ Located at Boulder, Colorado 80302.

⁴ Part of the Center for Building Technology.

THE STANDARDS OF TIME AND FREQUENCY IN THE U.S.A. ⁺⁺

James A. Barnes and G.M.R. Winkler [†]

Time and Frequency Division
Institute for Basic Standards
National Bureau of Standards
Boulder, Colorado 80302

[†] Time Service Division
U.S. Naval Observatory
Washington, D.C. 20390

^{††} This publication was also published as Chapter 11 of
Time and Frequency: Theory and Fundamentals, NBS Monograph 140



U.S. DEPARTMENT OF COMMERCE, Frederick B. Dent, Secretary

NATIONAL BUREAU OF STANDARDS, Richard W. Roberts, Director

Issued February 1974

National Bureau of Standards Technical Note 649

Nat. Bur. Stand. (U. S.). Tech. Note 649. 91 pages February 1974)

CODEN: NBTNAE

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402

(Order by SD Catalog No. C13.46:649) \$1.00

CONTENTS

	<u>Page</u>
1. INTRODUCTION	1
2. TIME SCALES - TERMS OF REFERENCE	1
2.1. Compromise Time Scales	3
3. TIME AND FREQUENCY (T&F) ACTIVITIES OF THE NATIONAL BUREAU OF STANDARDS AND THE U. S. NAVAL OBSERVATORY	4
3.1. The Formal Missions of the T&F Activities of the NBS and USNO	4
a. T&F Activities of NBS	4
b. The Position of the U. S. Naval Observatory in the Federal Government	6
3.2. T&F Activities of NBS and the USNO Compared	9
3.3. Coordination of T&F	9
4. INTERNATIONAL ORGANIZATIONS INVOLVED IN STANDARD TIME AND FREQUENCY	12
4.1. Organization of the Treaty of the Meter (Standards).	12
4.2. Scientific Organizations	15
4.3. International Radio Consultative Committee (CCIR) (Regulatory).	15
5. THE LEGAL DEFINITION OF "STANDARD TIME"	15
6. SUMMARY	18
7. REFERENCES	18
APPENDIX A. NBS Enabling Legislation	21
APPENDIX B. USNO Authorizing Documents	37
APPENDIX C. NBS Time and Frequency Responsibilities	45
APPENDIX D. USNO Precise Time and Time Interval (PTTI) Responsibilities	46
APPENDIX E. NBS/USNO Time Coordination/Services	57
APPENDIX F. Treaty of the Meter	62
APPENDIX G. Legal Documents Concerning "Standard Time"	65

LIST OF FIGURES

	<u>Page</u>
Figure 1. The Time and Frequency Division of the NBS	5
Figure 2. The USNO Time Service Division	8
Figure 3. NBS, USNO, and BIH Interactions	10
Figure 4. Time Scales in the United States of America	13
Figure 5. International Organizations Involved with Standard Frequency and Time	14
Figure 6. Time Zones of the United States of America	17

LIST OF TABLES

Table 1. Time and Frequency Responsibilities of NBS/USNO	11
Table 2. Abbreviations of International Organizations	16

THE STANDARDS OF TIME AND FREQUENCY IN THE U.S.A.

J. A. Barnes and G.M.R. Winkler

This paper describes the national responsibilities for standards of time and frequency in the U.S.A. The National Bureau of Standards (NBS) and the U. S. Naval Observatory (USNO) are the two organizations chiefly involved in distributing accurate and precise time and frequency information within the U.S.A. The NBS is responsible for the "custody, maintenance, and development of the national standards" of frequency and time (interval) as well as their dissemination to the general public. The mission of the USNO includes the "provision of accurate time" for electronic navigation systems, communication, and space technology. This is an integral part of its work concerned with the publication of ephemerides which are used in support of navigation and in the establishment of a fundamental reference system in space.

Both agencies provide the U. S. contribution to the Bureau International de l'Heure (BIH) [International Time Bureau], which has the responsibility of publishing definitive values of Universal Time (UT), International Atomic Time (TAI), and Coordinated Universal Time (UTC).

Key words: Astronomical time measurements; clock synchronization; clocks; Coordinated Universal Time (UTC); frequency; frequency standards; International Atomic Time (TAI); International Radio Consultative Committee (CCIR); International Scientific Radio Union (URSI); International Time Bureau (BIH); international time organizations; leap seconds; national time/frequency standards; NBS time and frequency; Precise Time and Time Interval (PTTI); time; time coordination; time interval; time scales; Treaty of the Meter (standards); U.S.A. standard time zones; USNO time and frequency.

1. INTRODUCTION

The national responsibilities for the provision of standards of time and frequency (T&F) in the U.S.A. rests with two organizations of widely different background, professional traditions, and outlook (NBS enabling legislation and USNO authorizing documents (app. A and B)). The measurement of T&F permeates all scientific observations. It is fundamental to any system of measurement standards, and it is an indispensable element in fundamental astronomy, geodesy, and navigation. It follows from this wide range of applications and interfaces with all disciplines of science and technology that requirements for standards of T&F can only be satisfied in some form of compromise.

A short discussion of principles and terminology, followed by a minimum of historical accounts, will facilitate the review of the present distribution of work and responsibilities of the two agencies involved, the National Bureau of Standards (NBS) and the United States Naval Observatory (USNO). International organizations with time and frequency responsibilities in the areas of standards, scientific groups, and regulatory bodies are described. A brief section outlines the status of the legal definition of "standard time" in the U.S.A. Seven appendixes document various aspects of the contents of this paper.

2. TIME SCALES: TERMS OF REFERENCE

A time scale is any system which allows the unambiguous ordering of events. Calendars are (rather coarse) time scales. Indeed, the daily movement of the sun, stars, and the moon provides the Time Scale prototype, even though the standard intervals are not uniform. Uniformity is a requirement which is becoming increasingly more important for two reasons, one scientific and the other operational. The widespread application of manifestly nonuniform time scales is impractical without corrections which render the scales uniform. Wide applications of time scales require

synchronization of clocks. Once synchronized, such clocks become the vehicle of access to all kinds of time scales. Thus, the study of synchronization also would be properly said to belong to the broader study of time in general.

A time scale is a system which allows one to assign "dates" to events, where date refers to some designated mark on a time scale. (Some people use "epoch" for our designation of "date".) We prefer to use the word "date" if both day and time of day are given for the event. There are many astronomical and clock time scales. The unrestricted word "time" can embody various aspects of time scales, time measurement, as well as time interval or duration. Thus, one cannot say that "time" is determined solely by astronomical means, since different time scales exist in biology, geology, and physics. On the other hand, the calendar and fraction of a day is the legal standard to which we ultimately refer most events for "dating".

Clocks are devices capable of generating and counting time intervals. In order to do this in a most uniform manner, modern atomic clocks derive their frequency (rate) reference from inner atomic processes, shielded as much as possible from external disturbing influences. Such clocks must also contain counters and displays of accumulated time intervals. Since repetitive phenomena are involved here, time, in one way or another, is always identified with angles whether we deal with the rotating earth or with 1 MHz signals from a frequency standard. Our conventional hours, minutes, and seconds are angular measures ("hour angle") of astronomy ("Universal" Time, UT).

In reviewing the historical development of time scales, one becomes aware that, with the rapidity and far-reaching consequences of communication, the greater are the demands for an all-pervasive and unifying convention of synchronizing clocks. That is, it is a matter of convenience and importance that they read the same time, but not necessarily on an absolute time base. An accuracy of a few seconds is perhaps important and sufficient in the operation of railroads. Now, however, sophisticated telecommunications equipment exists which can send and receive several million alphanumeric characters each second; thus, there are accuracy requirements for clock synchronizations to microseconds or better.

Celestial navigators require earth-based time signals to establish their position as determined from the angular orientation of the earth. Since the earth rotates on its axis about once every 24 hours, a navigator can determine his longitude by means of a sextant (which gives him local solar time) and the knowledge of solar time at Greenwich. Approximately 200 years ago the first chronometers were built which allowed the accurate determination of longitude while at sea. Until radio made its appearance, navigation at sea was very dependent upon good clocks. Nowadays, there are many standard time broadcast stations in the world. The best known standard time broadcast stations in North America are operated by the National Bureau of Standards (USA) and the National Research Council (Canada); WWV (NBS) is located in Fort Collins, Colorado, and CHU (NRC) is near Ottawa, Ontario.

Recently, more sophisticated uses of UT have come into being as in geodetic astronomy, star and satellite tracking, and very-long-baseline radio interferometry (VLBI) which require (and can also provide) UT with millisecond accuracy. Since the rotation of the earth is not strictly uniform (variations in the length of the day are of the order of a part in 10^8) a problem exists in relation to clock time which can be kept stable to about one part in 10^{13} .

Additional difficulties with clock time arise if used in the prediction of cosmic phenomena as, for example, orbital position of celestial bodies or times of arrival of signals from "pulsars". These latter signals can be resolved today with a precision of better than 5 μ s [1]. It is clear that such uses demand a clock time offering more than simply the means for synchronization such as required for electronic system applications.

2.1. Compromise Time Scales

We have identified very different uses for time. One use allows very high speed and extended electronic systems to function. The needs here are for extremely accurate and/or precise synchronization and measurements of time interval. Another use was for celestial navigation and astronomy. Here the need for precision is less but there are now additional requirements for "epoch" which cannot be set arbitrarily. If Universal Time (UT) could be measured with sufficient accuracy and convenience, the UT could also be used for time systems synchronization. In actuality, Universal Time is difficult to measure, and accuracies at this time are limited to one millisecond (after the fact).

Conflicting requirements imposed on time scales by such varied categories of time scale users provided impetus to form a compromise time scale which would adequately reflect the needs and relative importance of system synchronization as well as navigation and astronomy. With the growing importance and sophistication of communications systems and the implementation of electronic navigation systems (to supplement direct celestial navigation), the trend in the compromise time scales has turned from time scales based solely on the earth's rotation (i.e., astronomical time scales) to those referenced to atomic resonance. In particular, it is quite instructive to explain here briefly the new compromise time scale (called UTC) which became effective internationally on January 1, 1972 [2].

As we mentioned previously, the spinning earth does not make a very good clock. In point of fact, commercial atomic clocks in common use today are about one hundred thousand times more uniform than the spinning earth. Nonetheless, navigators need earth time (i.e., earth position relative to the stars) in real time no matter how erratic and unpredictable it might be. We find ourselves in a rather familiar situation. There is not a whole number of days in the year, and we don't want the calendar to get badly out of step with the seasons. Similarly, there is not a whole number of seconds in a solar day, and we don't want our clocks to get badly out of step with the sun. The solution is analogous to the leap year with its extra day; we have an extra second--a leap second.

In fact, since January 1, 1972, the internationally accepted and used clock time scale can, on occasion, incorporate leap seconds to keep our clocks in approximate step with the sun, thus satisfying the needs of the navigators [3]. In contrast to leap years which occur at defined intervals, the need for leap seconds is not precisely predictable but there should not be more than one in about a year's time. This lack of predictability arises because the earth doesn't spin at a constant rate. In any event leap seconds are going to be with us for a while. They allow a time scale (UTC) running at a constant rate, but whose time still approximates a clock defined by the rotating earth. The compromise time scale, by international agreement, thus provides UTC (atomic) which will be kept within about 700 ms of UT1 (earth), the navigators' time scale.

3. TIME AND FREQUENCY (T&F) ACTIVITIES OF THE
NATIONAL BUREAU OF STANDARDS AND THE U.S. NAVAL OBSERVATORY

3.1. The Formal Missions of T&F Activities of the NBS and USNO

a. T&F Activities of NBS

In Title 15 of the United States Code §272, it states: "Sec. 2. The Secretary of Commerce is authorized to undertake the following functions:

"(a) The custody, maintenance, and development of the national standards of measurement, and the provision of means and methods for making measurements consistent with those standards, including the comparison of standards used in scientific investigations, engineering, manufacturing, commerce, and educational institutions with the standards adopted or recognized by the Government." In particular the authorization specified: "(11) the broadcasting of radio signals of standard frequency" [4]. In Department of Commerce Order, DO 30-2A (June 19, 1972), the above authority is delegated to the Director of the National Bureau of Standards. (app. A).

The four independent base units of measurement currently used in science are length, mass, time, and temperature. In certain fields of science such as cosmology, geology, navigation, and astronomy, time interval and (astronomical) date are both important concepts. However, with respect to the fundamental foundations of science, time interval is the most important concept. This is true because the "basic laws" of physics are differential in nature and usually involve small time intervals.

Based on these laws and extensive experimentation, scientists have been able to demonstrate that frequency can be controlled and measured with the smallest percentage error of any physical quantity. Since most clocks depend on some periodic phenomenon (e.g., a pendulum) in order to "keep time", and since one can make reliable electronic counters to count the "swings" of the periodic phenomena, we can construct clocks with an elapsed time accuracy of the frequency standard.

In fact, the international definition of the second (unit of time interval) is based on the resonance frequency of the cesium atom. The present definition, approved by the 13th General Conference of Weights and Measures (CGPM) in 1967, states [5]:

"The second is the duration of 9 192 631 770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the cesium-133 atom."

The second must therefore be considered as one of the most important base units of the "Système International" (SI), the measurement system used for all scientific and technological measurements [6].

In response to this state of affairs, there is a Time and Frequency Division within the National Bureau of Standards. This Division has three major thrusts as shown in figure 1.

(1) One of these is concerned with basic standards of time and frequency. Presently, it consists of two program areas (i.e., Quantum Electronic Frequency Standards and Atomic Time Standards). Their prime responsibilities are shown in figure 1. Principally, they are engaged in research and development of both primary and backup frequency standards, and associated time scales [7,8], innovation of state-of-art T&F processes [9,10], and operation of the NBS primary standards of frequency and time interval.

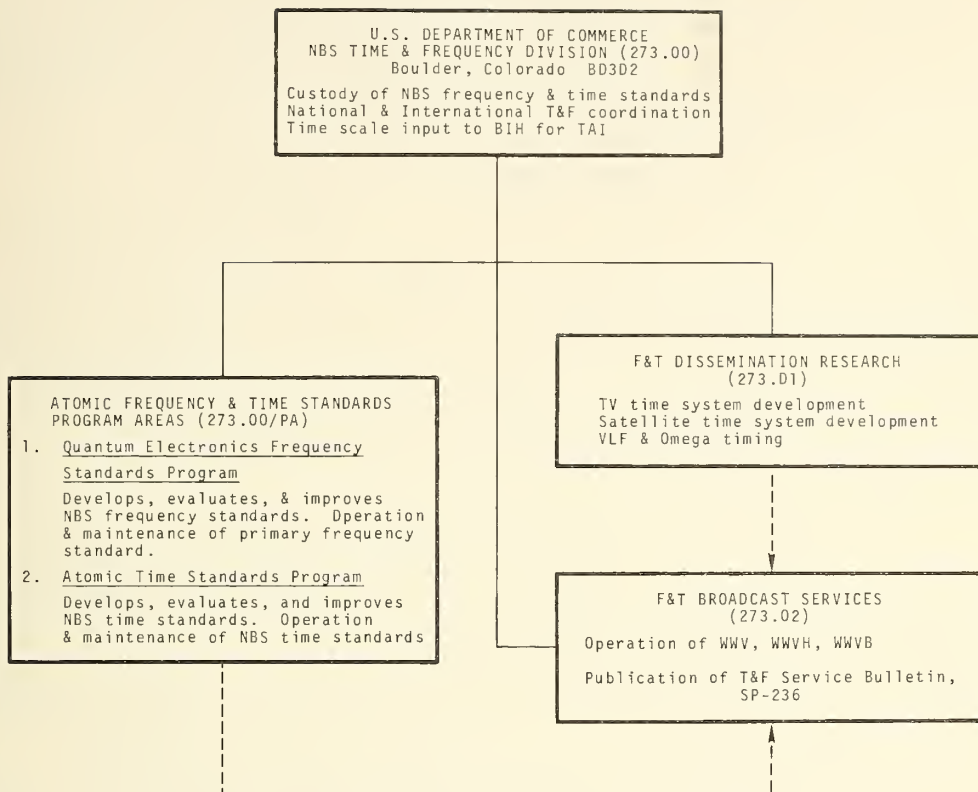


Figure 1. The Time and Frequency Division of the NBS.

(2) The Frequency-Time Dissemination Research Section conducts research and development activities on new methods of disseminating time and frequency information. As examples, this Section developed the TV line-10 synchronization pulse technique [11] based on the work of Tolman et al. [12]; devised and perfected a more extensive TV time system [13,14] which actively encodes time signals in the vertical interval; and developed some satellite timing techniques [15,16].

(3) The Frequency-Time Broadcast Services Section disseminates the NBS standard frequencies and time scales via radio (WWV, WWVH, and WWVB), and via telephone (303-499-7111). More detailed information about these services may be obtained by requesting NBS Special Publication 236 [17] from:

Frequency-Time Broadcast Services Section, 273.02
National Bureau of Standards
Boulder, Colorado 80302.

This Section also publishes a monthly bulletin giving NBS time scale information, phase deviations of standard frequency transmissions, and TV and satellite information (see app. E).

All of the activities of these groups are coordinated both nationally and internationally through the Time and Frequency Division Office. In a formal sense, the mission of the Division and the individual Sections and Program Areas are summarized in appendix C. This appendix also includes a brief description of postdoctoral research associateships assigned to the Division with the cooperation of the National Research Council.

b. The Position of the U. S. Naval Observatory
in the Federal Government

The U. S. Naval Observatory performs the same public functions as the national observatories of the principal countries of the world. Its nearest counterparts are the Royal Greenwich Observatory (United Kingdom), the Pulkovo Observatory (USSR), and the Paris Observatory (France). It is the sole authority in the United States for astronomical data required for public and legal purposes, such as times of sunrise and sunset, moonrise and moonset, and almanacs required for marine and air navigation, and for land surveying [18,19].

By virtue of its official mission [20] (see app. B), the primary function of the U. S. Naval Observatory is to provide accurate time and other astronomical data which are essential for safe navigation at sea, in the air, and in space. To carry out this function, it is necessary for the Observatory to maintain continual observations of the positions and motions of the sun, moon, planets, and principal stars. From some of these observations astronomical time is determined.

The determination and dissemination of precise clock time, which the Observatory has developed to very high precision, is essential to many military operations, especially the fields of electronic navigation, communications, and space technology. In response to these needs, the Department of Defense has charged the USNO with single management responsibilities for T&F in the Department of Defense [21] (see app. D). The Naval Observatory also concentrates on astrometry (precise measurements of angular distances between celestial objects), celestial mechanics (theories and calculations of the motions of celestial bodies), and astrophysics. It operates the most modern and precise special-purpose astronomical equipment in the world, most of which has been designed by its staff, and is comprised of about 20 telescopes of various kinds at its stations in Washington, D.C., Arizona, Florida, and Argentina [22].

The Observatory is also a computing center and publishing house, calculating and publishing each year 1000 pages of navigational data, 500 pages of astronomical predictions, and averaging 250 pages of research papers, all of which are published in book form, as well as numerous research papers in astronomical journals.

(1) The USNO Time Service Division, Background. There has been a continuous evolution from the first public "time service", the dropping of the USNO time ball at noon (1844), to the many services rendered today (app. E). Many of these services and operations were the first of their kind; for example:

(a) In 1904 the first worldwide radio time signals were broadcast from a U. S. Navy station based on a clock provided and controlled by the Observatory.

(b) A "Photographic Zenith Tube" (PZT) has been used by the Observatory since 1915 for the determination of latitude and since 1933 for the determination of latitude and Universal Time (UT).

(c) The "Dual Rate Moon Camera" was invented by William Markowitz in 1951, and it became the instrument with which the frequency of cesium (which today is the basis for the definition of the second) was determined with respect to the ephemeris second. This assured a clock rate which allows the use of atomic time (A.1 and now TAI) as an extrapolation of ephemeris time [23].

(d) The first atomic time scale (A.1) using the value for the cesium frequency (later adopted internationally) also applied the principle of an "average clock" [24]. Originally, A.1 was determined from all available cesium clocks throughout the world.

The USNO clock time scale is still derived from a set of "standard" clocks (selected commercial cesium standards). In contrast, the NBS atomic time scale is based on a laboratory cesium standard and a set of commercial cesium standards which serve as a memory of the rate of the primary standard. Only USNO clocks are used today for the USNO clock time reference [25,26]. There are also other substantial differences in basic philosophy between NBS and USNO which may be resolved only after much more experience becomes available [27].

(2) Organizations of USNO Time Service Division. There are four sections within this Division as shown in figure 2:

(a) Control of Time/Time Interval Section. This section is responsible for all electronics support and instruments. It monitors T&F transmissions of United States electronic systems and other precise T&F transmissions (WWVL, GBR, foreign time signals, etc.) and prepares control messages to stations controlled directly by the USNO. It prepares Time Service Announcements, Series 2,3,4,5,8,9, and 16 (see app. E).

(b) Precise Time Operations Section. This section is responsible for external liaison and portable clock operations used for national and international coordination. It carries the main load of PTTI management responsibilities as assigned by the Department of Defense Directive [21].

(c) Astronomy, Washington, D.C. This section is responsible for observations with the PZT, Astrolabe and Moon Camera in Washington. It is responsible for all computer software including automatic data acquisition and control system, and is responsible for the atomic clock time scale under direct supervision of the Assistant Director. It is also responsible for Time Service Announcements, Series 1,6,7,10,11, 12,13, and 17 (see app. E).

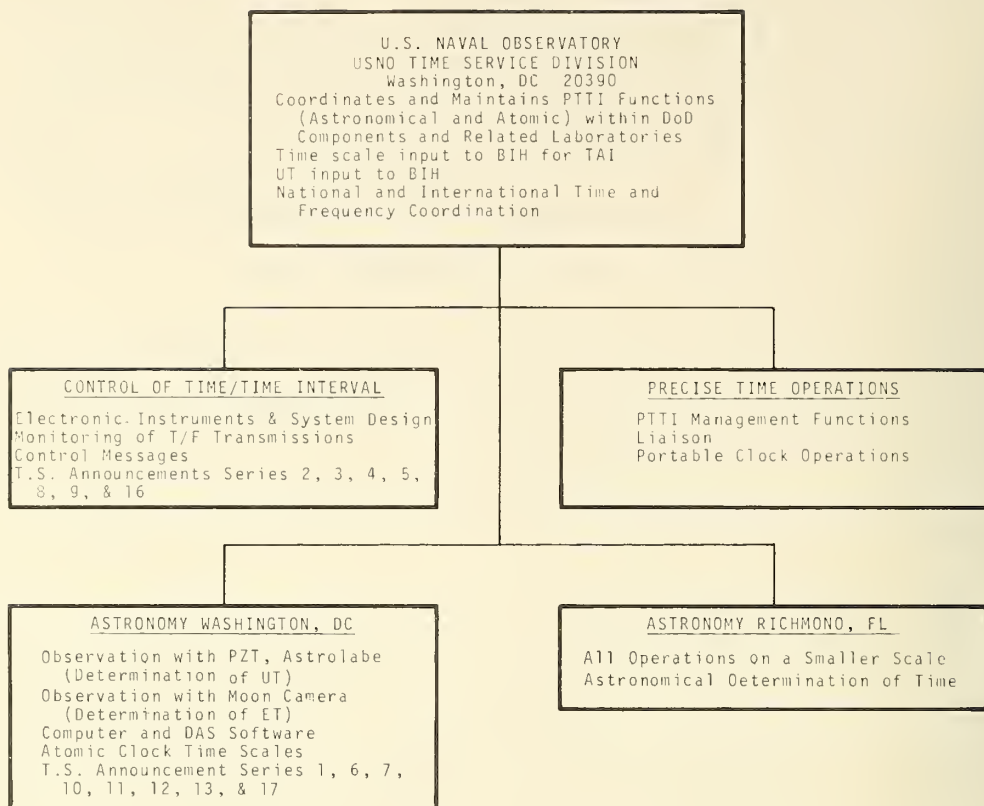


Figure 2. The USNO Time Service Division.

(d) Astronomy, Richmond, Florida (near Miami). This is a largely independent observatory capable of all Washington time operations on a smaller scale. It is a station with one of the most favorable climatic conditions anywhere (320 clear nights per year compared to 210 at Washington, D.C.). In addition, background radio noise is low, and this makes the station valuable as a monitor site.

The above listed activities produce only part of the information which is published daily, weekly, monthly, and irregularly by the USNO Time Service Division (see app. E). A great number of messages and notes are received regularly from cooperating stations all over the world whose contributions make it possible to achieve today a truly "worldwide continuity of precision" in time measurements with which the USNO is specifically charged [21]. In addition, the USNO initiates annual PTTI meetings for T&F specialists to consider new and improved techniques in the field [28].

3.2. T&F Activities of NBS and USNO Compared

As listed in the previous section, the main interactions of the two agencies can be summarized as shown in figure 3. Both agencies provide input to the BIH (at the Paris Observatory) which is charged to provide a central international reference point for time and related matters. NBS and USNO are both substantial contributors to the International Atomic Time Scale (TAI) constructed by the BIH and now serving as reference for UTC. NBS provides input in regard to absolute accuracy of the rate of TAI (and the U.S. clock time scales as well). USNO provides UT0 and latitude information.

In conformance with the specific mission statements, as cited above, time and absolute frequency are central but not exclusive areas of concern, competence, and responsibility of the USNO and NBS respectively. Both areas are very closely linked, which requires equally close cooperation between the two agencies. For example, the NBS broadcasts of standard frequency have as a most logical extension a 24-hour standard time signal broadcast. Commensurate with the NBS introduction of these and similar services (a TV and a satellite T&F dissemination are being actively investigated by NBS), the USNO has reduced or eliminated some of its own dissemination services. Today, the Naval time signals are on the air for only 5-minute periods every 1, 2, or more hours (but on about 30 frequencies) [29]. They are intended to supplement the WWV and WWVH emissions. These HF services of NBS are very important to the USNO and its "customers" (navigators, geodesists, astronomers, etc.).

It is noteworthy that table 1, which summarizes the main points of this discussion, represents only a historical ideal. Clock coordination has diminished the direct significance of USNO's role as a national time standard since the UTC(NBS) - UTC(USNO) time difference is less than 6 μ s since June 1968 [30] and since both agencies provide independent clock time input to the BIH. On the other hand, the real standard of frequency is now the cesium atom and there is no longer a U.S. frequency standard (or a U.S. second) just as there is no U.S. meter. However, there is U.S. input to the absolute SI second from a primary frequency standard at the NBS.

3.3. Coordination of T&F

Each agency, NBS and USNO, derives an entirely independent local atomic time scale: AT(NBS) and A.1(USNO). AT(NBS) is based on (occasional) calibrations of its operational standards (8 commercial cesium clocks) with the NBS primary frequency standard. A.1(USNO) is based on a set of 16 best commercial cesium clocks selected as "standards" from about 70 cesium clocks available to the USNO. A.1(USNO) results

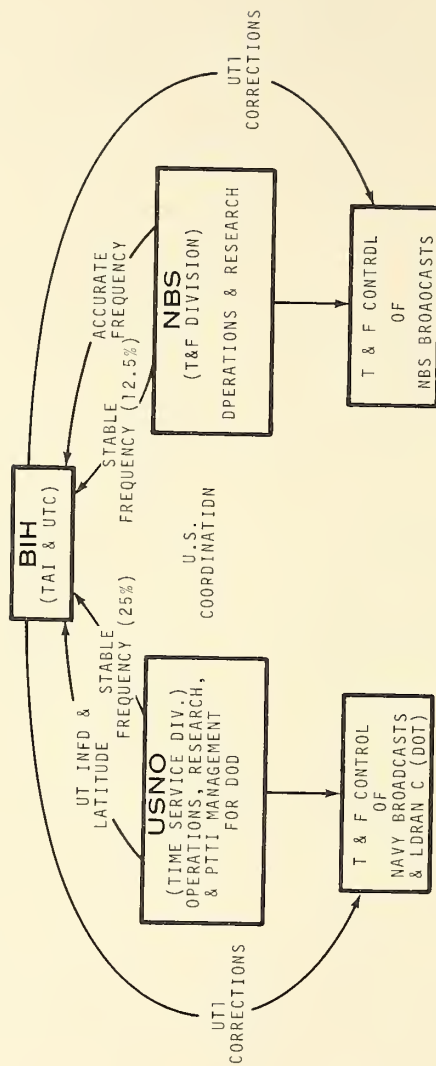


Figure 3. NBS, USNO, and BIH Interactions.

Table 1. T&F Responsibilities of NBS/USNO

NBS	USNO
<u>National Standard of Frequency;</u> <u>Standard Frequency (and Time) Broadcast;</u> <u>Fundamental Research in T&F as related</u> <u>to Clock Time and Frequency Measure-</u> <u>ments, Synchronization;</u> <u>Consultation and Education;</u> <u>USNO Precise Time Reference Station.</u>	<u>National Standard of Time (Epoch, Date);</u> <u>Control of Naval T&F Transmissions;</u> <u>Applied Research in Time as related to</u> <u>Clock applications, Astronomy,</u> <u>Geophysics, Navigation;</u> <u>Consultation and Management of PTTI</u>
	<u>activities as related to DOD.</u>

from an adjusted, iterated averaging procedure which makes the average rate of the time scale independent of the particular clocks used and assures very great reliability. Both of these inputs are used by the BIH to compute the TAI and UTC scales.

The agencies' coordinated clocks are derived with a deliberate coordination offset ($<10^{-12}$). The International Radio Consultative Committee (CCIR) and the International Astronomical Union (IAU) recommend 1 ms as the maximum tolerance [2,31]. As noted previously, UTC(NBS) and UTC(USNO) have been less than 6 μ s since 1968; also they are now within a few microseconds of UTC(BIH). It is the intent to achieve even closer coordination in the future. Figure 4 depicts the coordination of time scales within the USA with input to the BIH (see app. E).

In addition to clock time, UT1 and the coordinates of the pole are furnished internationally by the BIH [32] and in the USA by the USNO [33]. (The pole coordinates are given at various times and at the three levels of "Predicted", "Preliminary" (BIH "Rapid Service"), and "Final".) In view of the fact that the BIH values are averages of some 50 observatories, its values are precise to better than 1 ms in UT1 and about 0".01 in x and y (polar coordinates). The results of the International Latitude Service (ILS, now IPMS) can be considered more accurate but less precise than BIH in the polar coordinates since the definition of the Standard Pole (OCI) refers to the 5 latitude stations and not to the BIH observatories [34]. With the increase of participating observatories, the relative importance of these U.S. contributions has decreased. We can expect similar developments with respect to the U.S. local atomic time scales as more national timekeeping agencies contribute to the TAI.

4. INTERNATIONAL ORGANIZATIONS INVOLVED IN STANDARD TIME AND FREQUENCY

The general subject of time and frequency is important in three fundamentally different ways. Firstly, it is important as one of the four independent base units in metrology (i.e., length, mass, time, and temperature); that is, it is important to the *Système International* (SI) of units of measurement. Secondly, time and frequency are important scientifically in their own right, not just as they influence measurements; and thirdly, the methods of dissemination of standard time and frequency are important from a regulatory aspect such as the assignment of radio spectrum for broadcast purposes of standard time and frequency. Correspondingly, one can find three separate chains of international involvement with time and frequency as shown in figure 5 (i.e., standards, scientific, and regulatory).

4.1. Organizations of the Treaty of the Meter (Standards)

The USA was one of the original signers of the Treaty of the Meter in 1875 [35] (see app. F). This treaty established an international standards laboratory (Bureau International des Poids et Mesures, BIPM) which is governed by an international committee (Comité International des Poids et Mesures, CIPM) composed of representatives of the member nations. Advisory to the CIPM are various technical consultative committees (e.g., the Consultative Committee for the Definition of the Second (CCDS), the Consultative Committee for the Definition of the Meter (CCDM), etc.). Policy decisions such as financial assessments of the member nations and final endorsements of new definitions of standards are handled by a General Conference of Weights and Measures (CGPM).

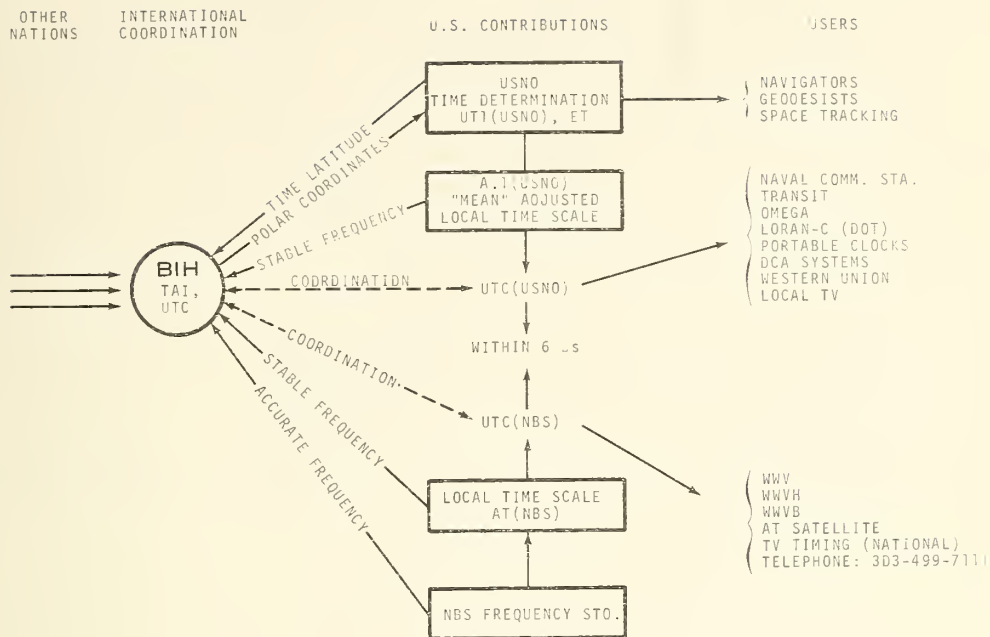


Figure 4. Time Scales in the United States of America.

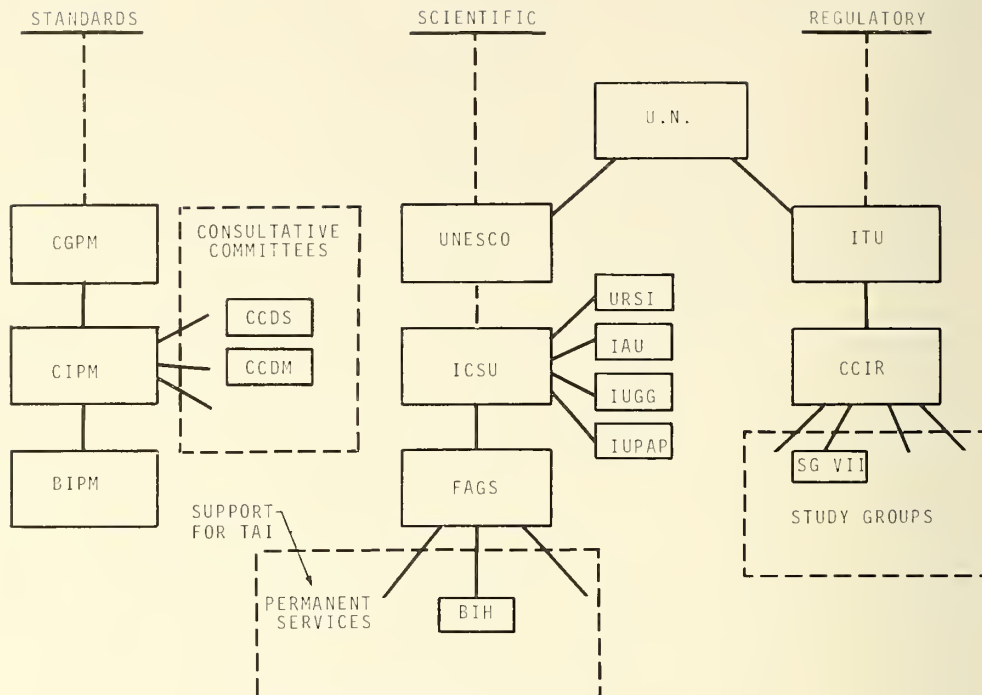


Figure 5. International Organizations Involved with Standard Frequency and Time.

4.2. Scientific Organizations

Scientific involvement occurs through the International Council of Scientific Unions (ICSU) which receives support and financial assistance from the United Nations Educational, Scientific, and Cultural Organization (UNESCO). Also, in our area, there are four scientific unions (see table 2 for abbreviations): URSI, IAU, IUPAP, and IUGG. Within these scientific unions, T&F matters are primarily confined to URSI Commission 1 and IAU Commission

ICSU has established a number of permanent services administered by the Federation of Astronomical and Geophysical Services (FAGS). These permanent services include the Bureau International de l'Heure (BIH), the International Polar Motion Service (IPMS), and others. Historically, the BIH has had the responsibility of coordinating and calculating the final and formally-adopted measurement of time. With the advent of atomic clocks and with the recommendations of the IAU, the BIH established its own atomic time scale (TAI) which is based, ultimately, on a weighted average of various local atomic time scales [36]. The CGPM has endorsed the TAI scale for defining International Atomic Time (date) [37], and the CGPM will also provide some financial assistance to the BIH.(

4.3. International Radio Consultative Committee (CCIR) (Regulatory)

Advisory to the International Telecommunications Union (ITU) is the CCIR with its numerous Study Groups. Study Group 7 of the CCIR is concerned with standard frequency and time broadcasts. The recommendations of CCIR specify the acceptable formats for standard frequency and time broadcasts as well as the tolerances of the broadcast scales relative to the time scales of the BIH [2]. Although these recommendations do not have the force of international law, almost all countries carefully adhere to them.

For each of the international organizations cited above there exist either national delegates or national committees which formulate the national policy to be presented to the international organizations.

5. THE LEGAL DEFINITION OF "STANDARD TIME"

The legal basis of Standard Time in the USA is contained in the "Uniform Time Act of 1966" (Public Law 89-387) [38] and the U. S. Code, Title 15 [39] (see app. G). This act reiterates the policy of the United States to "promote the adoption and observance of uniform time within prescribed Standard Time Zones..." and establishes the annual advancement and retardation of standard time by 1 hour the last Sunday of April and October respectively. The Department of Transportation (DOT) is the agency designated for enforcement of the law.

The "Uniform Time Act" establishes eight Standard Time Zones for the USA (see fig. 6) and notes that Standard Time is based on the mean solar time of specified longitudes. The reference meridians are spaced 15° apart in longitude beginning with the meridian through Greenwich, England. Time zones extend 7-1/2° in longitude on each side with considerable variation in boundaries to conform to political and/or geographic boundaries. Since the time zones are 15° apart, the time difference between two adjacent zones is 1 hour. Mean solar time (related to UT0 and not UT1) is simply apparent solar time, corrected for the effects of orbital eccentricity and the tilt of the earth's axis relative to the ecliptic plane (i.e., corrected by the equation of time).

Table 2. Abbreviations of International Organizations

Abbreviation	Organization
BIH	International Bureau of Time
BIPM	International Bureau of Weights and Measures
CCDM	Consultative Committee for the Definition of the Meter
CCDS	Consultative Committee for the Definition of the Second
CCIR	International Radio Consultative Committee
CGPM	General Conference of Weights and Measures
CIPM	International Committee of Weights and Measures
FAGS	Federation of Astronomical and Geophysical Services
IAU	International Astronomical Union
ICSU	International Council of Scientific Unions
ITU	International Telecommunications Union
IUGG	International Union of Geodesy and Geophysics
IUPAP	International Union of Pure and Applied Physics
UN	United Nations
UNESCO	United Nations Educational, Scientific, and Cultural Organization
URSI	International Scientific Radio Union



Figure 6. Standard Time Zones of the United States of America.

The eight USA Standard Time Zones are designated as follows:

- | | |
|---------------------------|--------------------------------|
| 1. Atlantic Standard Time | 5. Pacific Standard Time |
| 2. Eastern Standard Time | 6. Yukon Standard Time |
| 3. Central Standard Time | 7. Alaska-Hawaii Standard Time |
| 4. Mountain Standard Time | 8. Bering Standard Time |

A comprehensive delineation of these zones is given in the Code of Federal Regulations entitled "Standard Time Zone Boundaries" (see app. G). This code indicates also the various exceptions and time zones for the operating railroads within the USA.

6. SUMMARY

Time and Frequency is a complex field with widely different requirements. Historically, two agencies have provided the standards of time and frequency in the USA; they are the USNO and the NBS, respectively. Their roles have evolved, however, into more diversified interests. The need to coordinate with the rest of the world and the new "natural" standards of time (the second) and length (the meter) produce a strong pressure for adjustment in the interest of improving our public services. This, together with the different professional backgrounds of the two agencies, has emphasized different thrusts of action. Operations and worldwide organization of resources have always been favored by astronomers, particularly those who use clocks as a means and not as an end.

On the other hand, questions of absolute accuracy in the realization of a measurement standard, research in the physics of clocks, and education in the use of standards is emphasized at NBS. Both agencies conduct research which is complementary rather than competitive not only because management wants it, but because of their different professional outlook and resources.

7. REFERENCES

- [1] Allan, D. W., "Time transfer using near-synchronous reception of optical pulsar signals," Proc. IEEE (Lett.), 60, No. 5, pp. 625-627 (May 1972).
- [2] CCIR, "Detailed instructions by Study Group 7 for the implementation of Recommendation 460 concerning the improved coordinated universal time (UTC) system, valid from 1 January 1972," in XIIth Plenary Assembly CCIR, III, pp. 258 a-d (ITU, Geneva, Switzerland, 1970).
- [3] Smith, H. M., "International time and frequency coordination," Proc. IEEE, 60, No. 5, pp. 479-487 (May 1972).
- [4] Committee on Judiciary of House of Representatives, United States Code: 1970 Edition, Title 15, 3, Chapter 7, "The National Bureau of Standards," §271-290, pp. 3231-3240 (1971).
- [5] CGPM, Comptes Rendus des Séances de la Treizième Conférence Générale des Poids et Mesures (Proceedings of the Sessions of the 13th General Conference of Weights and Measures) (Paris, France, October 1968), p. 103 (Gauthier-Villars, Paris, France, 1968) (in French).
- [6] Page, C. H., and Vigoureux, P. (Eds.), "The international system of units," (American translation of "Le Système International de Unités"), Nat. Bur. Stand. (U.S.) Spec. Publ. 330, 1972 Edition, p. 3 (April 1972).

- [7] Brandenberger, H., Hadorn, F., Halford, D., and Shoaf, J. H., "High quality quartz crystal oscillators: frequency domain and time domain stability," Proc. 25th Ann. Symp. on Frequency Control (U. S. Army Electronics Command, Ft. Monmouth, NJ 07703, April 26-28, 1971), pp. 226-230 (Electron. Ind. Assn., Washington, DC 20006, 1971).
- [8] Allan, D. W., "Statistical modeling and filtering for optimum atomic time scale generator," Proc. Frequency Standards and Metrology Seminar (Quebec, Canada, August 30-September 1, 1971), pp. 388-410 (Quantum Electronics Lab., Dept. of Elect. Eng., Laval University, Quebec, Canada, 1972).
- [9] Halford, D., Hellwig, H., and Wells, J. S., "Progress and feasibility for a unified standard for frequency, time, and length," Proc. IEEE (Lett.), 60, No. 5, pp. 623-625 (May 1972).
- [10] Hellwig, H. (Ed.), Proc. Frequency Standards and Metrology Seminar (Quebec, Canada, August 30-September 1, 1971) (Quantum Electronics Lab., Dept. of Elect. Eng., Laval University, Quebec, Canada, 1972).
- [11] Davis, D. D., Blair, E. E., and Barnaba, J., "Long-term continental U.S. timing system via TV networks," IEEE Spectrum, 8, No. 8, pp. 41-52 (August 1971).
- [12] Tolman, J., Ptáček, V., Souček, A., and Stecher, R., "Microsecond clock comparison by means of TV synchronizing pulses," IEEE Trans. Inst. and Meas., IM-16, No. 3, pp. 247-254 (September 1967).
- [13] Davis, D. D., Jespersen, J. L., and Kamas, G., "The use of television signals for time and frequency dissemination," Proc. IEEE (Lett.), 58, No. 6, pp. 931-933 (June 1970).
- [14] Howe, D. A., "Nationwide precise time and frequency distribution utilizing an active code within network television broadcasts," IEEE Trans. Inst. and Meas., IM-21, No. 3, pp. 263-276 (August 1972).
- [15] Hanson, D. W., and Hamilton, W. F., "Clock synchronization from satellite tracking," IEEE Trans. Aerosp. and Electron. Syst., AES-7, No. 5, pp. 895-899 (September 1971).
- [16] Hanson, D. W., Hamilton, W. F., and Gatterer, L. E., "The NBS frequency and time satellite experiment using ATS-3," Proc. 3rd Ann. Precise Time and Time Interval (PTTI) Strategic Planning Meeting (U. S. Naval Observatory, Washington, DC, November 16-18, 1971) pp. 155-165 (USNO, Washington, DC 20390, 1972).
- [17] Vierzicke, P. P. (Ed.), "NBS frequency and time broadcast services," Nat. Bur. Stand. (U.S.) Spec. Publ. 236, 1972 Edition, 14 pages (March 1972).
- [18] USNO/HMSO, The Nautical Almanac for the Year 1973 (issued jointly by Nautical Almanac Office/RGO-United Kingdom) 276 pages (1971).
- [19] USNO/HMSO, The Air Almanac - 1973 (January-April) (issued jointly by Nautical Almanac Office/RGO-United Kingdom) 242 pages (1972).
- [20] U. S. Navy/CNO, "Mission and functions of the U. S. Naval Observatory," U. S. Naval Operations Instruct. 5450.90B (December 16, 1969).
- [21] U. S. Department of Defense (DOD), "Precise time and time interval (PTTI) standards and calibration facilities for use by Department of Defense components," DOD Directive No. 5160.51 (August 31, 1971); also Code of Federal Regulations (CFR), Title 32 (National Defense), Chapter 1, "Part 275-Precise time and time interval (PTTI) standards and calibration facilities for use by Department of Defense components," pp. 550-552 (January 1, 1972). (NOTE: The CFR codifies agency regulations and should not be confused with the U. S. Code (USC) which codifies legal statutes, Presidential Orders, etc.)

- [22] USNO, United States Naval Observatory, 18 pages (USNO, Washington, DC 20390, 1972).
- [23] Markovitz, W., Hall, R. G., Essen, L., and Parry, J.V.L., "Frequency of cesium in terms of ephemeris time," *Phys. Rev. Lett.*, 1, pp. 105-106 (August 1962).
- [24] Markowitz, W., "The atomic time scale," *IRE Trans. Inst.*, I-11, Nos. 3 & 4, pp. 239-242 (December 1962).
- [25] Winkler, G.M.R., Hall, R. G., and Percival, D. B., "The U. S. Naval Observatory clock time reference and the performance of a sample of atomic clocks," *Metrologia*, 6, No. 4, pp. 126-134 (October 1970).
- [26] Putkovich, K., "Automated timekeeping," *IEEE Trans. Inst. and Meas.*, IM-21, No. 4, pp. 401-405 (November 1972).
- [27] Allan, D. W., and Gray, J. E., "Comments on the October 1970 *Metrologia* paper, 'The U. S. Naval Observatory clock time reference and the performance of a sample of atomic clocks'," *Metrologia*, 7, No. 2, pp. 79-82 (April 1971).
- [28] USNO/NASA, Proc. 4th Ann. NASA and DOD Precise Time and Time Interval (FTTI) Meeting (NASA Goddard Space Flight Center, Greenbelt, MD, November 14-16, 1972), 371 pages (NASA, Greenbelt, MD 20771, 1973).
- [29] USNO, "Worldwide primary VLF and HF transmissions," *Time Service Announcements*, Series 1, No. 1, 20 pages (USNO, Washington, DC 20390, July 1971).
- [30] NBS, "Nation gets unified time system," *Nat. Bur. Stand. (U.S.) Tech. News Bull.*, 53, No. 2, p. 34 (February 1969).
- [31] De Jager, C., and Jappel, A. (Eds.), "Commission 31: Time (l'heure)-Session 4," (Proc. 14th General Assembly, Brighton, England, 1970) *Trans. IAU*, XIV B, p. 198, Dordrecht, Holland: D. Reidel Publishing Co. (1971).
- [32] BIH, Monthly Circulars B, C, and D, and Annual Reports (BIH, Paris, France).
- [33] USNO, *Time Service Announcements*, Series 7 and 11 (USNO, Washington, DC 20390).
- [34] Mueller, I. I., Spherical and Practical Astronomy, pp. 80-84, New York: Frederick Ungar Publishing Co. (1969).
- [35] Schwarz, K. M., Federal and State Weights and Measures Laws, "Metric Convention-1875," *Nat. Bur. Stand. (U.S.) Circular* 501, pp. 3-5 (December 1951).
- [36] Guinot, B., Feissel, M., and Granveaud, M., Bureau International de l'Heure Annual Report for 1971, pp. A9-A20 (BIH, Paris, France, 1972).
- [37] CGPM, *Comptes Rendus des Séances de la Quatorzième Conférence Générale des Poids et Mesures* (Proc. of the Session of the 14th General Conference of Weights and Measures) (Paris, France, October 4-8, 1971), pp. 77-78 (BIPM, Sevres, France, 1972).
- [38] USA, "Uniform Time Act of 1966," Public Law 89-387, 89th Congress, S.1404 (April 13, 1966).
- [39] Committee on Judiciary of House of Representatives, United States Code: 1970 Edition, Title 15, 3, Chapter 6, "Weights and Measures and Standard Time," sec. 260-267, pp. 3228-3221 (1971).
- [40] NBS/NRC, "Postdoctoral research associateships - 1973 tenable at National Bureau of Standards (Washington, DC, and Boulder, CO)," in association with the National Research Council, pp. 31-32 (NRC, Washington, DC 20418, 1972).
- [41] Fizell, W. E., "On the determination of universal time and the use of the U. S. Naval Observatory Time Service Bulletins, Notices, and Announcements," NASA Report X-521-70-188, 28 pages (1970).

APPENDIX A

U. S. DEPARTMENT OF COMMERCE NATIONAL BUREAU OF STANDARDS ADMINISTRATIVE MANUAL	Chapter 1	Authority
	Subchapter 1	Legislative Authority

LEGISLATIVE AUTHORITY

Sections

- 1.01.01 Basic Legislation
- 1.01.02 Bureau Established
- 1.01.03 Functions of Secretary
- 1.01.04 Functions: For Whom Exercised
- 1.01.05 Director: Powers and Duties
- 1.01.06 Appointment of Officers and Employees
- 1.01.07 Service Charges
- 1.01.08 Ownership of Facilities
- 1.01.09 Regulations
- 1.01.10 Visiting Committee
- 1.01.11 Gifts and Bequests
- 1.01.12 Working Capital Fund
- 1.01.13 Acquisition of Land for Field Sites
- 1.01.14 Construction and Improvement of Buildings and Facilities
- 1.01.15 Functions and Activities
- 1.01.16 Fire Research and Safety
- 1.01.17 Multiyear Appropriation Authority
- 1.01.18 Testing Materials for District of Columbia
- 1.01.19 National Hydraulic Laboratory
- 1.01.20 Other Legislation
 - a. Standards of Electrical and Photometric Measurement
 - b. Research Associates

1.01.01

BASIC LEGISLATION

The National Bureau of Standards was established on March 3, 1901, by "An Act to Establish the National Bureau of Standards" (31 Stat. 1449). Extensive amendments were made in 1950 by passage of Public Law 81-619 (64 Stat. 371); in 1956 by Public Law 84-940 (70 Stat. 959); and in 1958 by Public Law 85-890 (72 Stat. 1711). The provisions of the organic act and amendments are merged in the following statement of basic legislation quoted from Title 15 of the United States Code.

1.01.02

BUREAU ESTABLISHED

(15 U.S.C. 271)

"The Office of Standard Weights and Measures shall be known as the National Bureau of Standards."

1.01.03

FUNCTIONS OF SECRETARY

(15 U.S.C. 272)

"The Secretary of Commerce (hereinafter referred to as the "Secretary") is authorized to undertake the following functions:

November 28, 1972
 (Trans. 181)

1.01.01 - 1.01.03

"(a) The custody, maintenance, and development of the national standards of measurement, and the provision of means and methods for making measurements consistent with those standards, including the comparison of standards used in scientific investigations, engineering, manufacturing, commerce, and educational institutions with the standards adopted or recognized by the Government.

"(b) The determination of physical constants and properties of materials when such data are of great importance to scientific or manufacturing interests and are not to be obtained of sufficient accuracy elsewhere.

"(c) The development of methods for testing materials, mechanisms, and structures, and the testing of materials, supplies, and equipment, including items purchased for use of Government departments and independent establishments.

"(d) Cooperation with other governmental agencies and with private organizations in the establishment of standard practices, incorporated in codes and specifications.

"(e) Advisory service to Government agencies on scientific and technical problems.

"(f) Invention and development of devices to serve special needs of the Government.

"In carrying out the functions enumerated in this section, the Secretary is authorized to undertake the following activities and similar ones for which need may arise in the operations of Government agencies, scientific institutions, and industrial enterprises:

"(1) the construction of physical standards;

"(2) the testing, calibration, and certification of standards and standard measuring apparatus;

"(3) the study and improvement of instruments and methods of measurements;

"(4) the investigation and testing of railroad track scales, elevator scales, and other scales used in weighing commodities for interstate shipment;

"(5) cooperation with the States in securing uniformity in weights and measures laws and methods of inspection;

"(6) the preparation and distribution of standard samples such as those used in checking chemical analyses, temperature, color, viscosity, heat of combustion, and other basic properties of materials; also the preparation and sale or other distribution of standard instruments, apparatus and materials for calibration of measuring equipment;

"(7) the development of methods of chemical analysis and synthesis of materials, and the investigation of the properties of rare substances;

"(8) the study of methods of producing and of measuring high and low temperatures; and the behavior of materials at high and at low temperatures;

"(9) the investigation of radiation, radioactive substances, and X-rays, their uses, and means of protection of persons from their harmful effects;

"(10) the study of the atomic and molecular structure of the chemical elements, with particular reference to the characteristics of the spectra emitted, the use of spectral observations in determining chemical composition of materials, and the relation of molecular structure to the practical usefulness of materials;

"(11) the broadcasting of radio signals of standard frequency;

"(12) the investigation of the conditions which affect the transmission of radio waves from their source to a receiver;

"(13) the compilation and distribution of information on such transmission of radio waves as a basis for choice of frequencies to be used in radio operations;

"(14) The study of new technical processes and methods of fabrication of materials in which the Government has a special interest; also the study of methods of measurement and technical processes used in the manufacture of optical glass and pottery, brick, tile, terra cotta, and other clay products;

"(15) the determination of properties of building materials and structural elements, and encouragement of their standardization and most effective use, including investigation of fire-resisting properties of building materials and conditions under which they may be most efficiently used, and the standardization of types of appliances for fire prevention;

"(16) metallurgical research, including study of alloy steels and light metal alloys; investigation of foundry practice, casting, rolling, and forging; prevention of corrosion of metals and alloys; behavior of bearing metals; and development of standards for metals and sands;

"(17) the operation of a laboratory of applied mathematics;

"(18) the prosecution of such research in engineering, mathematics, and the physical sciences as may be necessary to obtain basic data pertinent to the functions specified herein; and

"(19) the compilation and publication of general scientific and technical data resulting from the performance of the functions specified herein or from other sources when such data are of importance to scientific or manufacturing interests or to the general public, and are not available elsewhere, including demonstration of the results of the Bureau's work by exhibits or otherwise as may be deemed

most effective, and including the use of National Bureau of Standards scientific or technical personnel for part-time or intermittent teaching and training activities at educational institutions of higher learning as part of and incidental to their official duties and without additional compensation other than that provided by law."

1.01.04

FUNCTIONS: FOR WHOM EXERCISED (15 U.S.C. 273)

"The Bureau is authorized to exercise its functions for the Government of the United States and for international organizations of which the United States is a member; for governments of friendly countries; for any State or municipal government within the United States; or for any scientific society, educational institution, firm, corporation, or individual within the United States or friendly countries engaged in manufacturing or other pursuits requiring the use of standards or standard measuring instruments: Provided, That the exercise of these functions for international organizations, governments of friendly countries and scientific societies, educational institutions, firms, corporations, or individuals therein shall be in coordination with other agencies of the United States Government, in particular the Department of State in respect to foreign entities. All requests for the services of the Bureau shall be made in accordance with the rules and regulations established in sections 276 and 277 of this title (15 U.S.C.)."

1.01.05

DIRECTOR: POWERS AND DUTIES (15 U.S.C. 274)

"The director shall be appointed by the President, by and with the advice and consent of the Senate. He shall have the general supervision of the bureau, its equipment, and the exercise of its functions. He shall make an annual report to the Secretary of Commerce, including an abstract of the work done during the year and a financial statement. He may issue, when necessary, bulletins for public distribution, containing such information as may be of value to the public or facilitate the bureau in the exercise of its functions."

1.01.06

APPOINTMENT OF OFFICERS AND EMPLOYEES

(15 U.S.C. 275)

"The officers and employees of the bureau, except the director, shall be appointed by the Secretary of Commerce at such time as their respective services may become necessary."

to be attained in standards submitted for verification, the sealing of standards, the disbursement and receipt of moneys, and such other matters as he may deem necessary for carrying into effect sections 271-278b of this title [15 U.S.C.]."

1.01.07

SERVICE CHARGES

(15 U.S.C. 275a)

"The Secretary shall charge for services performed under the authority of section 273 of this title, [15 U.S.C.] except in cases where he determines that the interest of the Government would be best served by waiving the charge. Such charges may be based upon fixed prices or costs. The appropriation or fund bearing the cost of the services may be reimbursed, or the Secretary may require advance payment subject to such adjustment on completion of the work as may be agreed upon."

1.01.10

VISITING COMMITTEE

(15 U.S.C. 278)

"There shall be a visiting committee of five members to be appointed by the Secretary of Commerce, to consist of men prominent in the various interests involved, and not in the employ of the Government. This committee shall visit the bureau at least once a year, and report to the Secretary of Commerce upon the efficiency of its scientific work and the condition of its equipment. The members of this committee shall serve without compensation, but shall be paid the actual expenses incurred in attending its meetings. The period of service of the members of the committee shall be so arranged that one member shall retire each year, and the appointments to be for a period of five years. Appointments made to fill vacancies occurring other than in the regular manner are to be made of the remainder of the period in which the vacancy exists."

1.01.08

OWNERSHIP OF FACILITIES

(15 U.S.C. 276)

"In the absence of specific agreement to the contrary, additional facilities, including equipment, purchased pursuant to the performance of services authorized by section 273 of this title [15 U.S.C.] shall become the property of the Department of Commerce."

1.01.09

REGULATIONS

(15 U.S.C. 277)

"The Secretary of Commerce shall, from time to time, make regulations regarding the payment of fees, the limits of tolerance

United States of America DEPARTMENT OF COMMERCE	DEPARTMENT ORGANIZATION ORDER 30-2A	
DEPARTMENT ORGANIZATION ORDER SERIES	DATE OF ISSUANCE June 19, 1972	EFFECTIVE DATE June 19, 1972
SUBJECT NATIONAL BUREAU OF STANDARDS		
<p><u>SECTION 1. PURPOSE.</u></p> <p>This order delegates authority to the Director of the National Bureau of Standards, and prescribes the functions of the National Bureau of Standards.</p> <p><u>SECTION 2. STATUS AND LINE OF AUTHORITY.</u></p> <p>.01 The National Bureau of Standards, established by Act of March 3, 1901, (31 Stat. 1449 15 U.S.C. 271) is continued as a primary operating unit of the Department of Commerce.</p> <p>.02 The Director, who is appointed by the President by and with the advice and consent of the Senate, shall be the head of the Bureau. The Director shall report and be responsible to the Assistant Secretary for Science and Technology.</p> <p>.03 The Director shall be assisted by a Deputy Director, who shall be the principal assistant to the Director and shall perform the functions of the Director during the latter's absence or disability. He shall also serve as Acting Director whenever the position of Director is vacant, unless and until the Secretary shall make a further designation. In the absence of both the Director and Deputy Director, an employee of the Bureau designated in writing by the Director shall act as Director.</p> <p><u>SECTION 3. DELEGATION OF AUTHORITY.</u></p> <p>.01 Pursuant to authority vested in the Secretary of Commerce by law (including Reorganization Plans No. 3 of 1946, No. 5 of 1950, and No. 2 of 1965), and subject to such policies and directives as the Secretary of Commerce or the Assistant Secretary for Science and Technology may prescribe, the Director is hereby delegated the authority to perform the functions vested in the Secretary of Commerce by the following Chapters of Title 15, United States Code:</p> <ul style="list-style-type: none"> a. Chapter 6 (Weights and Measures); b. Chapter 7 (The Bureau of Standards, except for subsections 272(f) 12 and 13, which pertain to the investigation of the conditions which affect the transmission of radio waves, and the compilation and distribution of information on such transmission, which activities have been delegated to the Office of Telecommunications.); c. Chapter 25 (Flammable Fabrics); d. Chapter 26 (Household Refrigerators); and e. Chapter 39 (Fair Packaging and Labeling). <p>.02 The above delegations of authority are subject to the following limitations:</p> <ul style="list-style-type: none"> a. The Director may issue such regulations as he considers necessary to carry out his responsibilities, except that procedural regulations pertaining to the formulation, adoption, or publication of voluntary or mandatory product standards, as provided for or authorized by Chapters 7, 25, 26, and 39 of Title 15, U.S. Code, are to be issued by the Assistant Secretary for Science and Technology. 		

b. With respect to Chapter 25 of Title 15, U.S. Code, the authorities to adopt final flammability standards, to appoint members of, and deal with, the National Advisory Committee for the Flammable Fabrics Act, and to transmit an annual report of the results of the Department's activities in carrying out the Flammable Fabrics Act, as amended, are reserved to the Secretary. The authority to make determinations of possible need for, and to institute proceedings for the determination of, a flammability standard or other regulation is delegated to the Assistant Secretary for Science and Technology.

c. The authority to prescribe and publish commercial standards, pursuant to Section 1213, Chapter 26, Title 15, U.S. Code, is reserved to the Secretary.

d. With respect to Chapter 39 of Title 15, U.S. Code, the authority delegated in this order excludes the authority to make determinations of (1) an undue proliferation of weights, measures, or quantities, pursuant to 15 U.S.C. 1454 (d), and (2) the non-adoption of standards or the non-observance of adopted standards, pursuant to 15 U.S.C. 1454 (e), which authority is delegated to the Assistant Secretary for Science and Technology. The authorities to submit reports to the Congress concerning non-adoption or failure to observe voluntary product standards, pursuant to 15 U.S.C. 1454 (e), and to transmit an annual report to the Congress, as required by 15 U.S.C. 1457, are reserved to the Secretary.

.03 The Director is further delegated the authority to perform the functions assigned to the Secretary by Section 759(f), Chapter 16, Title 40, United States Code, pertaining to the conduct of research and the provision of scientific and technological advisory services relating to automatic data processing (ADP) and related systems, except that recommendations to the President concerning the establishment of uniform Federal ADP standards are reserved to the Secretary.

.04 The Director is further delegated the authority to perform the functions vested in the Secretary by:

a. Public Law 90-396 (82 Stat. 339), called the Standard Reference Data Act; and

b. Public Law 85-934 (72 Stat. 1793; 42 U.S.C. 1891-3) to make grants for the support of basic scientific research to nonprofit institutions of higher education and to nonprofit organizations whose primary purpose is the conduct of scientific research.

.05 Pursuant to the authority delegated to the Secretary by the Administrator of the General Services Administration (Temporary Regulation E-10, July 11, 1967, Federal Property Management Regulations), and subject to such policies and directives as the Secretary or the Assistant Secretary for Science and Technology may prescribe, the Director is hereby delegated authority to operate an automatic data processing service center.

.06 The authority delegated to the Secretary by the Administrator of the General Services Administration, dated August 15, 1967, (32 F.R. 11969), to appoint uniformed guards as special policemen and to make all needful rules and regulations for the protection of those parcels of property at National Bureau of Standards installations which are not protected by GSA guards, and over which the Federal Government has exclusive or concurrent jurisdiction, is hereby redelegated to the Director. This authority shall be exercised in accordance with the requirements of the Federal Property and Administrative Services Act of 1949 (63 Stat. 377), as amended, and the Act of June 1, 1948 (62 Stat. 281), as amended, and policies, procedures, and controls of the General Services Administration.

.07 The authority vested in the Secretary of Commerce, by Executive Order 11654, dated March 13, 1972, which pertains to the Federal Fire Council, is hereby delegated to the Director. This delegation shall include authority to serve as Chairman of the Council or to designate an employee of the National Bureau of Standards to serve in that capacity.

.08 The Director may exercise other authorities of the Secretary as applicable to performing the functions assigned in this order.

.09 The Director may redelegate his authority to any employee of the National Bureau of Standards subject to such conditions in the exercise of such authority as he may prescribe.

SECTION 4. FUNCTIONS.

.01 The National Bureau of Standards shall perform the following functions:

- a. Develop and maintain the national standards of measurement, and provide means for making measurements consistent with those standards;
- b. Determine the physical constants and properties of materials;
- c. Develop methods for testing materials, mechanisms, and structures, and conduct such tests thereof as may be necessary, with particular reference to the needs of Government agencies;
- d. Cooperate with and assist industry, business, consumers, and governmental organizations in the establishment, technical review, determination of acceptability, and publication of voluntary standards, recommended specifications, standard practices, and model codes and ordinances;
- e. Provide advisory service to Government agencies on scientific and technical problems;
- f. Conduct a program for the collection, compilation, critical evaluation, publication, and dissemination of standard reference data;
- g. Invent and develop devices to serve special scientific and technological needs of the Government;
- h. Conduct programs, in cooperation with United States business groups and standards organizations, for the development of international standards of practice;
- i. Conduct a program of research, investigation, and training with respect to the flammability characteristics of textiles and fabrics;
- j. Conduct research and provide technical services designed to improve the effectiveness of use by the Federal Government of computers and related techniques;
- k. Conduct a national fire research and safety program, (as provided for by Public Law 90-259 (82 Stat. 34-39) amending Chapter 7 of Title 15, United States Code);
- l. Conduct a program to provide an experimental basis for formulation of Government policy to stimulate the development and use of technology by industry; and
- m. Coordinate the activities of the Federal Fire Council.

.02 The Bureau shall perform the following functions, pursuant to the Fair Packaging and Labeling Act (Chapter 39, Title 15, United States Code):

- a. Ascertain the number and other characteristics of the weights, measures, and quantities in which commodities are packaged for retail sale;
- b. Conduct studies of the relationship between the weights, measures, and quantities in which commodities are packaged and the ability of consumers to make value comparisons;
- c. Conduct studies concerning the extent to which voluntary product standards adopted pursuant to 15 U.S.C. 1454 are being followed by industry;

United States of America DEPARTMENT OF COMMERCE	DEPARTMENT ORGANIZATION ORDER 30-2B	
DEPARTMENT ORGANIZATION ORDER SERIES	DATE OF ISSUANCE June 12, 1972	EFFECTIVE DATE June 12, 1972

SUBJECT

NATIONAL BUREAU OF STANDARDS

SECTION 1. PURPOSE.

This order prescribes the organization and assignment of functions within the National Bureau of Standards (NBS). This revision establishes a Center for Building Technology under the Institute for Applied Technology, (paragraph 11.11) and makes certain other changes of a minor nature.

SECTION 2. ORGANIZATION.

The organization structure and line of authority of the National Bureau of Standards shall be as depicted in the attached organization chart.

SECTION 3. OFFICE OF THE DIRECTOR.

.01 The Director determines the policies of the Bureau and directs the development and execution of its programs.

.02 The Deputy Director assists the Director in the direction of the Bureau and performs the functions of the Director in the latter's absence.

SECTION 4. STAFF UNITS REPORTING TO THE DIRECTOR.

.01 The Office of Academic Liaison shall serve as the focal point for the Bureau's cooperation with the academic institutions, and serve as liaison office for cooperative research activities between the Bureau and other Government agencies.

.02 The Office of Legal Adviser shall, under the professional supervision of the Department's General Counsel and as provided in Department Organization Order 10-6, serve as the law office of and have responsibility for all legal services at the National Bureau of Standards.

SECTION 5. OFFICE OF THE ASSOCIATE DIRECTOR FOR PROGRAMS.

The Office of the Associate Director for Programs shall perform the functions of policy development, program analysis, and program promotion; sponsor and coordinate the performance of issue and impact studies; relate Bureau programs to national needs; generate planning formats and develop information on NBS program plans and status for internal and external audiences; administer evaluation panels; and define alternatives for the allocation of resources and advise Bureau management on their implications.

SECTION 6. OFFICE OF THE ASSOCIATE DIRECTOR FOR ADMINISTRATION.

.01 The Associate Director for Administration shall be the principal assistant and adviser to the Director on management matters and is responsible for the conduct of administrative management functions, including the management of NBS buildings, plants, and non-scientific facilities. He shall carry out these responsibilities primarily through the organization units specified below, which are under his direction.

.02 The Accounting Division shall administer the official system of central fiscal records, payments and reports, and provide staff assistance on accounting and related matters.

.03 The Administrative Services Division shall be responsible for security, safety, emergency planning, and civil defense activities; provide mail, messenger, communications, duplicating, and related office services; manage use of auditorium and conference rooms; conduct records and forms management programs; operate an NBS records holding area; manage the NBS motor vehicle fleet; and provide janitorial service.

.04 The Budget Division shall provide advice and assistance to line management in the preparation, review, presentation, and management of the Bureau's budget encompassing its total financial resources.

.05 The Personnel Division shall advise on personnel policy and utilization; administer recruitment, placement, classification, employee development and employee relations activities; and assist operating officials on these and other aspects of personnel management.

.06 The Plant Division shall maintain the physical plant at Gaithersburg, Maryland, and perform staff work in planning and providing grounds, buildings, and improvements at other Bureau locations.

.07 The Supply Division shall procure and distribute material, equipment, and supplies purchased by the Bureau, keep records and promote effective utilization of property, act as the Bureau coordinating office for research, construction, supply and lease contracts of the Bureau, and administer telephone communications services and travel services.

.08 The Management and Organization Division shall provide consultative services to line management in organization, procedures, and management practices; develop administrative information systems; maintain the directives system; and perform reports management functions.

.09 The Instrument Shops Division shall design, construct, and repair precision scientific instruments and auxiliary equipment.

SECTION 7. OFFICE OF THE ASSOCIATE DIRECTOR FOR INFORMATION PROGRAMS.

.01 The Associate Director for information Programs shall promote optimum dissemination and accessibility of scientific information generated within NBS and other agencies of the Federal Government; promote the development of the National Standard Reference Data System and a system of information analysis centers dealing with the broader aspects of the National Measurement System; provide appropriate services to ensure that the NBS staff has optimum accessibility to the scientific information of the world; and direct public information activities of the Bureau.

.02 The Office of Standard Reference Data shall administer the National Standard Reference Data System which provides critically evaluated data in the physical sciences on a national basis. This requires arrangement for the continuing systematic review of the national and international scientific literature in the physical sciences, the evaluation of the data it contains, the stimulation of research needed to fill important gaps in the data, and the compilation and dissemination of evaluated data through a variety of publication and reference services tailored to user needs in science and industry.

.03 The Office of Technical Information and Publications shall foster the outward communication of the Bureau's scientific findings and related technical data to science and industry through reports, articles, conferences and meetings, films, correspondence and other appropriate mechanisms; and assist in the preparation, scheduling, printing and distribution of Bureau publications.

.04 The Library Division shall furnish diversified information services to the staff of the Bureau, including conventional library services, bibliographic, reference, and translation services; and serve as a reference and distribution center for Congressional legislative materials and issuances of other agencies.

.05 The Office of International Relations shall serve as the focal point for Bureau activities in the area of international scientific exchanges.

SECTION 8. CENTER FOR COMPUTER SCIENCES AND TECHNOLOGY.

.01 The Center for Computer Sciences and Technology shall conduct research and provide technical services designed to aid Government agencies in improving cost effectiveness in the conduct of their programs through the selection, acquisition, and effective utilization of automatic data processing equipment (Public Law 89-306); and serve as the principal focus within the executive branch for the development of Federal standards for automatic data processing equipment, techniques, and computer languages.

.02 The Director shall direct the development, execution, and evaluation of the programs of the Center.

.03 The functions of the organizational units of the Center are as follows:

a. The Office of Information Processing Standards shall provide leadership and coordination for Government efforts in the development of information processing standards at the Federal, national, and international levels.

b. The Office of Computer Information shall function as a specialized information center for computer sciences and technology.

c. The Computer Services Division shall provide computing and data conversion services to NBS and other agencies on a reimbursable basis; and provide supporting problem analysis and computer programming as required.

d. The Systems Development Division shall conduct research in information sciences and computer programming; develop advanced concepts for the design and implementation of data processing systems; and provide consultative services to other agencies in software aspects of the design and implementation of data processing systems.

e. The Information Processing Technology Division shall conduct research and development in selected areas of information processing technology and related disciplines to improve methodologies and to match developing needs with new or improved techniques and tools.

SECTION 9. INSTITUTE FOR BASIC STANDARDS.

.01 The Institute for Basic Standards shall provide the central basis within the United States of a complete and consistent system of physical measurement; coordinate that system with measurement systems of other nations; and furnish essential services leading to accurate and uniform physical measurements throughout the Nation's scientific community, industry, and commerce.

.02 The Office of the Director.

- a. The Director shall direct the development, execution, and evaluation of the programs of the Institute.
- b. The Deputy Director shall assist in the direction of the institute and perform the functions of the Director in the latter's absence.
- c. The Deputy Director, Institute for Basic Standards/Boulder shall assist in the direction of the Institute's programs at Boulder and report to the Associate Director for Administration through the Director, IBS, in supervising the administrative divisions at Boulder.
- d. The administrative divisions reporting to the Deputy Director, Institute for Basic Standards/Boulder include:

- Supply Services Division
- Instrument Shops Division
- Plant Division

These divisions and units within his office shall provide staff support for the technical program and administrative services for the NBS organization at Boulder, Colorado. The administrative units and divisions shall also service, as needed, National Oceanic and Atmospheric Administration and Office of Telecommunications units at Boulder, Colorado, and associated field stations.

.03 The Office of Measurement Services shall coordinate the Bureau's measurement services program, including development and dissemination of uniform policies on Bureau calibration practices.

.04 The Center for Radiation Research shall constitute a prime resource within the Bureau for the application of radiation, not only to Bureau mission problems, but also to those of other agencies and other institutions. The resulting multipurpose and collaborative functions reinforce the capability of the Center for response to Bureau mission problems.

- a. The Director shall report to the Director, Institute for Basic Standards, and shall direct the development, execution, and evaluation of the programs of the Center. The Deputy Director shall assist in the direction of the Center and perform the functions of the Director in the absence of the latter.
- b. The organizational units of the Center for Radiation Research are as follows:

- Linac Radiation Division
- Nuclear Radiation Division
- Applied Radiation Division

Each of these Divisions shall engage in research, measurement, and application of radiation to the solution of Bureau and other institutional problems, primarily through collaboration.

.05 The other organization units of the Institute for Basic Standards are as follows:

Located at Bureau Hdqrs.

Applied Mathematics Division
Electricity Division
Mechanics Division
Heat Division
Optical Physics Division

Located at Boulder, Colorado

Quantum Electronics Division
Electromagnetics Division
Time and Frequency Division
Laboratory Astrophysics Division
Cryogenics Division

a. Each Division except the Applied Mathematics Division shall engage in such of the following functions as are appropriate to the subject matter field of the Division:

1. Develop and maintain the national standards for physical measurement, develop appropriate multiples and sub-multiples of prototype standards, and develop transfer standards and standard instruments;
2. Determine important fundamental physical constants which may serve as reference standards, and analyze the self-consistencies of their measured values;
3. Conduct experimental and theoretical studies of fundamental physical phenomena of interest to scientists and engineers with the general objective of improving or creating new measurement methods and standards to meet existing or anticipated needs;
4. Conduct general research and development on basic measurement techniques and instrumentation, including research on the interaction of basic measuring processes on the properties of matter and physical and chemical processes;
5. Calibrate instruments in terms of the national standards, and provide other measurement services to promote accuracy and uniformity of physical measurements;
6. Correlate with other nations the national standards and definitions of the units of measurement; and
7. Provide advisory services to Government, science, and industry on basic measurement problems.

b. The Applied Mathematics Division shall conduct research in various fields of mathematics important to physical and engineering sciences, automatic data processing, and operations research, with emphasis on statistical, numerical and combinatorial analysis and systems dynamics; provide consultative services to the Bureau and other Federal agencies; and develop and advise on the use of mathematical tools, in checking mathematical tables, handbooks, manuals, mathematical models, and computational methods.

SECTION 10. INSTITUTE FOR MATERIALS RESEARCH.

.01 The Institute for Materials Research shall conduct materials research leading to improved methods of measurement, standards, and data on the properties of materials needed by industry, commerce, educational institutions, and Government; provide advisory and research services to other Government agencies; and develop, produce, and distribute standard reference materials.

.02 The Director shall direct the development, execution and evaluation of the programs of the Institute. The Deputy Director shall assist in the direction of the Institute and perform the functions of the Director in the latter's absence.

.03 The Office of Standard Reference Materials shall evaluate the requirements of science and industry for carefully characterized reference materials which provide a basis for calibration of instruments and equipment, comparison of measurements and materials, and aid in the control of production processes in industry; and stimulate the Bureau's efforts to develop methods for production of needed reference materials and direct their production and distribution.

.04 The other organization units of the Institute for Materials Research are as follows:

Analytical Chemistry Division
Polymers Division
Metallurgy Division
Inorganic Materials Division
Reactor Radiation Division
Physical Chemistry Division

Each Division shall engage in such of the following functions as are appropriate to the subject matter field of the Division:

- a. Conduct research on the chemical and physical constants, constitution, structure, and properties of matter and materials;
- b. Devise and improve methods for the preparation, purification, analysis, and characterization of materials;
- c. Investigate fundamental chemical and physical phenomena related to materials of importance to science and industry, such as fatigue and fracture, crystal growth and imperfections, stress, corrosion, etc.;
- d. Develop techniques for measurement of the properties of materials under carefully controlled conditions including extremes of high and low temperature and pressure and exposure to different types of radiation and environmental conditions;
- e. Assist in the development of standard methods of measurement and equipment for evaluating the properties of materials;
- f. Conduct research and development methodology leading to the production of standard reference materials, and produce these materials;
- g. Provide advisory services to Government, industry, universities, and the scientific and technological community on problems related to materials;
- h. Assist industry and national standards organizations in the development and establishment of standards; and
- i. Cooperate with and assist national and international organizations engaged in the development of international standards.

SECTION 11. INSTITUTE FOR APPLIED TECHNOLOGY.

.01 The Institute for Applied Technology shall provide technical services to promote the use of available technology and to facilitate technological innovation in industry and Government; cooperate with public and private organizations leading to the development of technological standards (including mandatory safe standards), codes and methods of test; and provide technical advice and services to Government agencies upon request. The Institute shall also monitor NBS engineering standards activities and provide liaison between NBS and national and international engineering standards bodies.

.02 The Director shall direct the development, execution, and evaluation of the programs of the Institute. The Deputy Director shall assist in the direction of the Institute and perform the functions of the Director in the latter's absence.

.03 The Office of Engineering Standards Services shall cooperate with and assist producers, distributors, users and consumers, and agencies of the Federal, State, and local governments in the establishment of standards for products, and shall administer the Department of Commerce's Voluntary Product Standards program as set forth in Part 10 of Title 15, Code of Federal Regulations, "Procedures for the Development of Voluntary Product Standards".

.04 The Office of Weights and Measures shall provide technical assistance to the States with regard to model laws and technical regulations, and to the States, business, and industry in the areas of testing, specifications, and tolerances for weighing and measuring devices, to design, construction, and use of standards of weight and measure of associated instruments, and the training of State and local weights and measures officials. The office includes the Master Railway Track Scale Depot, Clearing, Illinois.

.05 The Office of Invention and Innovation shall analyze the effect of Federal laws and policies (e.g., tax, anti-trust, and regulatory policies) on the national climate for invention and innovation; undertake studies in related areas with other agencies; and assist and encourage inventors through inventors' services and programs, including cooperative activities with the States.

.06 The Product Evaluation Technology Division shall develop the technology, standards, and test methods for evaluating products including their systems, components, and materials.

.07 The Electronic Technology Division shall develop criteria for the evaluation of products and services in the general field of electronic instrumentation; cooperate with appropriate public and private organizations in identifying needs for improved technology in this field; and cooperate in the development of standards, codes and specifications. Further, it shall apply the technology of electronic instrumentation to the development of methods of practical measurement of physical quantities and properties of materials.

.08 The Technical Analysis Division shall conduct benefit-cost analyses and other basic studies required in planning and carrying out programs of the Institute. This includes the development of simulations of industrial systems and of Government interactions with industry, and the conduct of studies of alternative Institute programs. On request, the Division shall provide similar analytic services for other programs of the Department of Commerce, in particular, those of the science-based bureaus, and, as appropriate, for other agencies of the executive branch.

.09 The Measurement Engineering Division shall serve the Bureau in an engineering consulting capacity in measurement technology; and provide technical advice and apparatus development supported by appropriate research, especially in electronics, and in the combination of electronics with mechanical, thermal, and optical techniques.

.10 The Fire Technology Division shall (a) conduct data gathering, research, education and demonstration programs on fire, its causes, prevention, and control, and on the flammability of products, fabrics, and materials; (b) develop test methods and standards in flammability; and (c) coordinate all other fire research and safety activities of the National Bureau of Standards.

.11 The Center for Building Technology shall consult with industry, government agencies, professional associations, labor organizations, consumers, and such organizations as the National Conference of States on Building Codes and Standards in developing test methods for evaluating the performance of buildings including their materials and components, the support and stability characteristics of their elements and systems, the effects of new design strategies, their fire safety and environmental characteristics, and their service and communication systems; formulating performance criteria for building design and urban systems; and performing research, including research on safety factors, in the systems approach to building design and construction, in improving construction and management efficiency, in building material characteristics, in structural behavior, and in building environmental systems.

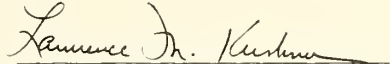
a. The Director shall report to the Director, Institute for Applied Technology and shall direct the development, execution and evaluation of the programs of the Center. The Deputy Director shall assist in the direction of the Center and perform the functions of the Director in the latter's absence.

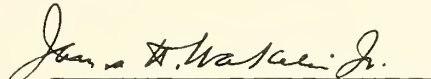
b. The organizational units of the Center for Building Technology shall be:

Office of Housing Technology
Office of Federal Building Technology
Office of Building Standards and Codes Services
Building Environment Division
Structures, Materials and Life Safety Division
Technical Evaluation and Application Division.

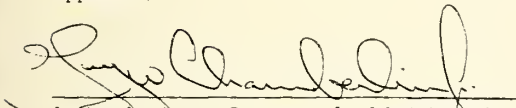
SECTION 12. EFFECT ON OTHER ORDERS.

This order supersedes Department Organization Order 30-2B of November 16, 1970, as amended.


Acting Director, National Bureau of
Standards


Assistant Secretary for Science and
Technology

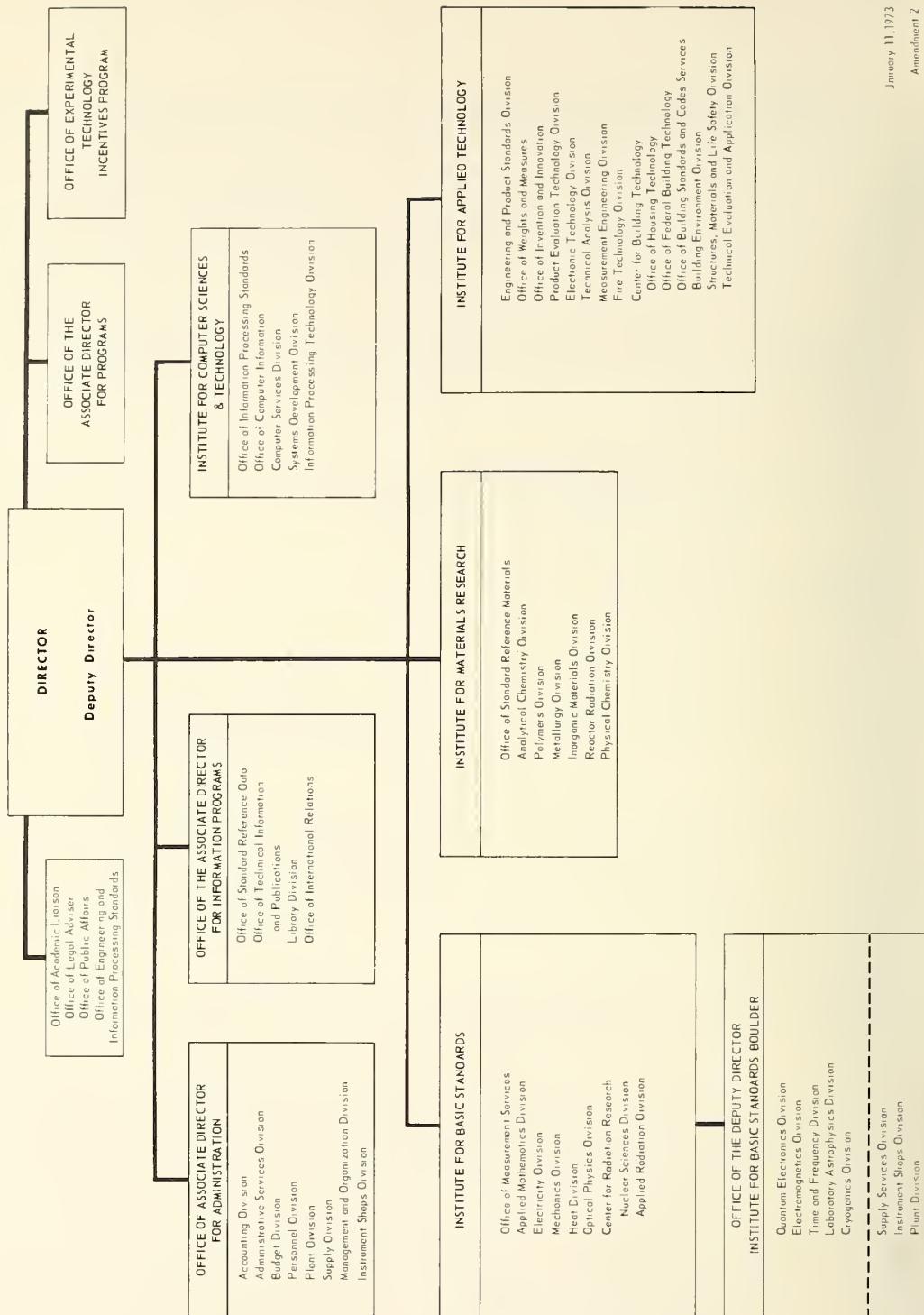
Approved:


Acting Assistant Secretary for Administration

USCOMM-DC - 50368

U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards

Attachment to ODD 30-2B



January 11, 1973
 Amendment 2

APPENDIX B

EXECUTIVE ORDER 9126

TRANSFERRING COGNIZANCE OF THE DUTIES AND FUNCTIONS OF THE HYDROGRAPHIC OFFICE AND THE NAVAL OBSERVATORY FROM THE BUREAU OF NAVIGATION, NAVY DEPARTMENT, TO THE CHIEF OF NAVAL OPERATIONS

By virtue of the authority vested in me by Title I of the First War Powers Act, 1941, approved December 18, 1941 (Public Law 354, 77th Congress), and for the more effective exercise and more efficient administration of my powers as Commander in Chief of the Army and Navy, it is hereby ordered as follows:

1. The duties and functions of the Hydrographic Office and Naval Observatory, Bureau of Navigation, Navy Department, are hereby transferred to the cognizance and jurisdiction of the Chief of Naval Operations under the direction of the Secretary of the Navy.

2. All personnel, together with the whole of the records and public property now under the cognizance of the Bureau of Navigation in the Hydrographic Office and the Naval Observatory are assigned and transferred to the Office of Chief of Naval Operations.

FRANKLIN D ROOSEVELT

THE WHITE HOUSE,

April 8, 1942.

Page 1137

118 Special Message to the Congress Transmitting Reorganization Plan 3 of 1946. May 16, 1946

To the Congress of the United States:

I transmit herewith Reorganization Plan No. 3 of 1946, prepared in accordance with the provisions of the Reorganization Act of 1945.

The Plan contains reorganizations affecting a number of departments and establishments. Some continue on a permanent basis changes made by Executive order under authority of the First War Powers Act. A few make adjustments in the distribution of functions among agencies. The remainder deal with problems of organization within individual agencies. All are concerned with improving and simplifying particular phases of Government administration.

Each proposal is explained in more detail under the appropriate heading below.

I have found, after investigation, that each reorganization contained in the Plan is necessary to accomplish one or more of the purposes set forth in section 2(a) of the Reorganization Act of 1945.

DEPARTMENT OF THE TREASURY

The functions of the Bureau of Marine Inspection and Navigation were transferred from the Department of Commerce to the Coast Guard and the Bureau of Customs in 1942 by Executive order under the First War Powers Act. This arrangement has been proved successful by the experience of the past four years. Part I of the Reorganization Plan continues the arrangement on a permanent basis.

United States Coast Guard

The principal functions of the Bureau of Marine Inspection and Navigation were those of the inspection of vessels and their

equipment, the licensing and certifying of officers and seamen, and related functions designed to safeguard the safety of life and property at sea. Thus these functions are related to the regular activities and general purposes of the Coast Guard. The Coast Guard administered them successfully during the tremendous expansion of wartime shipping, by virtue of improvements in organization and program, many of which ought to be continued.

The Plan also transfers to the Coast Guard the functions of the Collectors of Customs relating to the award of numbers to undocumented vessels. These functions, too, were temporarily transferred to the Coast Guard in 1942.

Bureau of Customs

The Plan transfers to the Commissioner of Customs the functions of the Bureau of Marine Inspection and Navigation and the Secretary of Commerce relating to the documentation of vessels, measurement of vessels, administration of tonnage tax and tolls, entry and clearance of vessels and aircraft, regulation of coastwise trade and fisheries, recording of conveyances and mortgages of vessels, and protection of steerage passengers. These functions have always been performed at the ports by the Customs Service, although legal responsibility for their supervision was vested in the Bureau of Marine Inspection and Navigation and the Secretary of Commerce until transferred temporarily to the Commissioner of Customs under the wartime reorganization power.

The proposed transfer will permit more efficient administration by ending divided responsibility.

DEPARTMENT OF WAR AND DEPARTMENT OF
THE NAVY*Functions with Respect to Certain Insane Persons*

Prior to World War I practically all mental patients for whom the Federal Government was legally obligated to provide hospital care and treatment, including personnel of the armed forces, were hospitalized in St. Elizabeths Hospital, Washington, D.C. In addition, this hospital served as the mental hospital for the District of Columbia Government. Following World War I, the responsibility for hospital care of mentally ill war veterans was assigned to the Veterans Administration. Somewhat later, specialized hospital facilities were provided by the Bureau of Prisons of the Department of Justice to enable that agency to care for prisoners suffering from mental disorders.

With the growth in the population of the District of Columbia and the wartime expansion of the armed forces, the facilities of St. Elizabeths Hospital became inadequate. The War Department therefore established its own mental hospitals at the outset of World War II. Furthermore it became necessary a year ago for the Navy Department to discontinue the use of St. Elizabeths and to assume the responsibility for the care of its mental patients.

Since the return of the Coast Guard to the Treasury Department, the Public Health Service now provides care in its mental hospitals for personnel of the Coast Guard in accordance with the basic responsibility delegated to it in the Public Health Service Code enacted in 1944. The Plan abolishes the functions of St. Elizabeths Hospital with respect to insane persons belonging to the Coast Guard which are provided for by Sec. 4843 of the Revised Statutes (24 U.S.C. 191).

Responsibility for the care of mental patients has been allocated on the basis of the four broad categories of beneficiaries, namely, (1) veterans, to be cared for by the Veterans Administration; (2) military and naval personnel, to be cared for by the War and Navy Departments; (3) prisoners, for whom the Department of Justice will be responsible; and (4) other civilians, to be cared for by the Federal Security Agency. The Reorganization Plan, in order to carry out this policy, provides for the transfer or abolition of certain functions and legal responsibilities now resting with the Federal Security Administrator and Superintendent of St. Elizabeths Hospital.

NAVY DEPARTMENT

Hydrographic Office and Naval Observatory

The Plan transfers the Hydrographic Office and the Naval Observatory from the Bureau of Naval Personnel to the Office of the Chief of Naval Operations. The Plan would confirm and make permanent the action taken in 1942 by Executive Order No. 9126 under the First War Powers Act.

The functions performed by both the Hydrographic Office and the Naval Observatory relate primarily to operational matters and thus are more appropriately placed in the Office of the Chief of Naval Operations than in the Bureau of Naval Personnel. This fact was recognized in the realignment of naval functions at the outbreak of the war. The Plan merely confirms an organizational relationship which has existed successfully for the past four years.

Supply Department of the United States Marine Corps

The Plan consolidates the Paymaster's Department and the Quartermaster's Department of the United States Marine Corps into

a single Supply Department. This consolidation will establish in the Marine Corps an integrated supply organization which parallels that of the Navy Department's Bureau of Supplies and Accounts.

The consolidation will make possible a more efficient and more economical organization of the companion functions of supply and disbursement, eliminating the present handling of related items by two separate departments of the Corps.

DEPARTMENT OF THE INTERIOR

The Franklin D. Roosevelt Library at Hyde Park

At the present time, the National Park Service, the Public Buildings Administration, and the Archivist of the United States all perform "housekeeping" functions at the Franklin D. Roosevelt Library and home at Hyde Park. The Plan unifies in the National Park Service responsibility for activities of this character at Hyde Park—that is, the maintenance and protection of buildings and grounds, the collection of fees, and the handling of traffic and visitors. Because of its wide experience in the administration of historic sites, the National Park Service is the logical agency to assume the combined functions.

Transfer of these functions does not affect the responsibility of the Archivist for the contents and professional services of the Library proper. It also does not affect the present disposition of the receipts, which is provided by law.

Functions Relating to Mineral Deposits in Certain Lands

The Plan transfers to the Department of the Interior jurisdiction over mineral deposits on lands held by the Department of Agriculture.

The Department of the Interior now administers the mining and mineral leasing laws on various areas of the public lands, including those national forests established on parts of the original public domain. The Department of Agriculture, on the other hand, has jurisdiction with respect to mineral deposits on (1) forest lands acquired under the Weeks Act, (2) lands acquired in connection with the rural rehabilitation program, and (3) lands acquired by the Department as a part of the Government's effort to retire submarginal lands.

Accordingly this Reorganization Plan provides that these mineral deposits on lands of the Department of Agriculture will be administered by the Department of the Interior, which already has the bulk of the Federal Government's mineral leasing program.

The Plan further provides that the administration of mineral leasing on these lands under the jurisdiction of the Department of Agriculture will be carried on subject to limitations necessary to protect the surface uses for which these lands were primarily acquired.

Bureau of Land Management

The Plan consolidates the General Land Office and the Grazing Service of the Department of the Interior into a Bureau of Land Management.

The General Land Office and the Grazing Service now divide responsibility for the major portion of the multiple-use Federally-owned lands now held by the Department of the Interior. The lands under jurisdiction of the two agencies are comparable in character and in use. In some functions, the two agencies employ the same type of personnel and use the same techniques. Other functions are divided between the agencies so that both are engaged in management of

various aspects of the same land. Consolidating these two agencies will permit the development of uniform policies and the integration of two organizations whose responsibilities now overlap.

Integration of the activities of the two agencies will make possible greater utilization and thus more economic use of expert skills. The same practical experience embraced in range administration on public lands in grazing districts will be available for public lands outside the districts.

Utilization of lands within grazing districts for non-grazing purposes will be subject to only one classification examination, rather than dual examination as is now necessary. Economy will be possible in the construction of range improvements, wherever feasible, to serve lands both in and out of districts. Legal procedures such as adjudication of issues relating to licenses and leases, hearings on appeal from administrative decisions, and the processing of trespass cases will benefit from unified administration and handling.

In such activities as fire protection, soil and moisture conservation, management of public lands under agreement with other agencies (e.g., Bureau of Reclamation), range surveys, maintenance and improvement of stock driveways, and stabilization of range use on all public domain, the benefits of consolidation will become increasingly apparent. Further, records relating to grazing lands can be concentrated in fewer field offices and hence administered more effectively.

While the establishment of a new Bureau of Land Management under a Director involves the abolition of the Commissioner and Assistant Commissioners of the General Land Office, the Director and Assistant Directors of Grazing, the Registers of District Land Offices, and the United States

Supervisor of Surveys, the statutory functions now discharged by these officers are in no way modified. This plan will place final responsibility for these functions in the Secretary of the Interior and make him responsible for their performance in coordination with the other land activities of his Department. Officers whose offices are specifically abolished, but whose experience will make them valuable to the Department, should be available for appointment in the new Bureau.

I have found and declare that by reason of the reorganization made by the Plan the responsibilities and duties of the Bureau of Land Management are of such nature as to require the inclusion in the Plan of provisions for the appointment and compensation of a Director, an Associate Director, and Assistant Directors.

DEPARTMENT OF AGRICULTURE

Functions of Certain Agencies of the Department of Agriculture

To enable the Department of Agriculture to meet its responsibilities for food production and distribution during the war, there was early and continuing coordination of its programs directly concerned with these phases of the food problem. Beginning with Executive Order No. 9069 of February 23, 1942, those programs and agencies dealing with food production and distribution were gradually consolidated by a series of Executive orders issued under the authority of the First War Powers Act. By Executive Order No. 9934 of April 19, 1943, they were all grouped into a War Food Administration, under a War Food Administrator.

When the fighting was drawing to a close and the emergency purposes of the War Food Administration had been largely accomplished, this Administration was ter-

minated by Executive Order No. 9577 of June 29, 1945; and its functions and agencies were transferred back to the jurisdiction of the Secretary of Agriculture. Executive Order No. 9577 also authorized the Secretary of Agriculture to organize and administer the transferred functions and agencies in the manner which he deemed best.

Under this authority, the Secretary established the Production and Marketing Administration in August 1945. Into this Administration, he consolidated the functions of many of the production and marketing agencies which were transferred back from the War Food Administration. Included were the functions of the Agricultural Adjustment Administration and the Surplus Marketing Administration and the administration of the programs of the Federal Crop Insurance Corporation and the Commodity Credit Corporation.

The Plan transfers these functions to the Secretary of Agriculture in order to permit him to continue the consolidation already effected in the Production and Marketing Administration. This provision makes it possible to maintain the close coordination and integration of food production and distribution programs, with the resulting benefits that were achieved during the war. It also provides the Secretary with the necessary flexibility to make adjustments in the coordination and administration of these programs to meet changing conditions and new problems, a flexibility which he particularly needs at this period of acute food shortages throughout the world.

DEPARTMENT OF COMMERCE

Certain Functions of National Bureau of Standards

The Plan transfers the functions of two divisions of the National Bureau of Stand-

ards in the Department of Commerce, namely, the Division of Simplified Trade Practices and the Division of Commercial Standards, to the Secretary of Commerce. The transfer will permit the Secretary to reassign these functions to the Office of Domestic Commerce, which is the focal point of the Department's general service functions for American business.

These two divisions were established as a result of the standardization work initiated in World War I. Both divisions have followed the same basic procedure of assisting the producers and the consumers of particular products to agree among themselves on certain standards or on a certain limited number of varieties. Each such voluntary agreement is then published by the National Bureau of Standards and, although not compulsory, has tended to become the generally accepted practice in the trade.

Standardization again proved to be an important device for accelerating production in World War II; and industry has shown renewed interest in continuing these wartime conservation and rationalization programs on a voluntary basis in the production of peacetime products.

The desirability of the proposed transfer was emphasized only a few months ago by the report of a committee of prominent businessmen appointed by the Secretary of Commerce to review the entire question of the Government's activities in this field. These studies indicate that two major benefits will result from the transfer.

First, the association of the two divisions with the National Bureau of Standards has perhaps tended to give the impression in some quarters that voluntary standards and trade practices worked out by industry with the help of these two divisions are in some sense Government standards which are enforced on the basis of scientific and objective

tests. The transfer of these two divisions to the Department proper would reduce any such misconceptions, and make it clear that these standards and simplified practices are voluntary industry agreements in the making of which the Government acts merely in an advisory capacity.

Second, the other general services of the Department to American business, such as marketing, management, and economic and statistical services, are now concentrated in the Office of Domestic Commerce. The association of these two divisions with these other services to business will facilitate their work and enable them to make use of the wide industrial and business contacts of the Office of Domestic Commerce.

NATIONAL LABOR RELATIONS BOARD

Strike Ballots Under the War Labor Disputes Act

The Plan abolishes the function of conducting strike ballots which was vested in the National Labor Relations Board by Section 8 of the War Labor Disputes Act (57 Stat. 167, ch. 144). Experience indicates that such elections under the act do not serve to reduce the number of strikes and may even aggravate labor difficulties. The Congress has already forbidden the Board to expend any of its appropriations for the current fiscal year for this activity (First Deficiency Appropriation Act of 1946). I believe that the function should now be permanently abolished.

SMITHSONIAN INSTITUTION

Canal Zone Biological Area

The Plan transfers responsibility for the Canal Zone Biological Area to the Smithsonian Institution. At present, the Canal Zone Biological Area is an independent

agency of the Government, having as its function the administration of Barro Colorado Island in Gatun Lake as a tropical wildlife preserve and research laboratory. The Board of Directors of this agency consists of the President of the National Academy of Sciences as Chairman, the Secretary of the Smithsonian Institution, three members of the Cabinet—the Secretaries of War, Interior, and Agriculture—and three biologists.

The transfer will locate this function with comparable and related functions already assigned to the Smithsonian Institution whose staff members have participated since the beginning in developing the island as a research center. It will reduce by one the number of Government agencies. It will relieve three Cabinet members of routine duties not important enough to warrant their personal attention.

Under its existing authority the Smithsonian Institution may constitute an advisory board of biologists and departmental representatives if it finds such action necessary.

UNITED STATES EMPLOYMENT SERVICE

Placement Functions Under Selective Training and Service Act of 1940

The Plan transfers to the United States Employment Service the functions of the Selective Service System and its Director with respect to assisting ex-servicemen in obtaining new positions. These functions directly overlap the regular placement activities of the United States Employment Service, which is required to provide a special placement service for veterans both by its basic act and by the Servicemen's Readjustment Act of 1944. The transfer is in line with the policy of the Congress on the placement of veterans as most recently expressed in the 1944 Act. The shift will prevent needless duplication of personnel and facilities and will assure the best service to veterans.

HARRY S. TRUMAN

NOTE: Reorganization Plan 3 of 1946 is published in the U.S. Statutes at Large (60 Stat. 1097) and in the 1943-1948 Compilation of title 3 of the Code of Federal Regulations (p. 1065). It became effective July 16, 1946.

16 December 1969

Mission and Functions of the
U.S. Naval Observatory

Mission: To make such observations of celestial bodies, natural and artificial, derive and publish such data as will afford to United States Naval vessels and aircraft as well as to all availing themselves thereof, means for safe navigation, including the provision of accurate time; and while pursuing this primary function, contribute material to the general advancement of navigation and astronomy.

Functions: In carrying out this mission, the Superintendent, U. S. Naval Observatory, shall perform the following functions:

1. Supervise and direct all functions, programs, and activities of the U. S. Naval Observatory, and command shore activities as assigned by the Chief of Naval Operations.
2. Recommend policies, plans, and programs deemed necessary or appropriate to promote the operational effectiveness or efficiency of the Naval Observatory.
3. Make continuous observations of the sun, moon, planets, stars, and other celestial bodies, natural and artificial, to determine their positions and motions.
4. Compile and publish the astronomical publications required for safe navigation and fundamental positional astronomy.
5. Derive, maintain and coordinate precise time and time interval (frequency), both astronomical and atomic, for the Department of Defense; and control distribution of, and provide single management service and interservice support to precise time and time interval within the Department of Defense.
6. Collaborate worldwide with astronomers through the exchange of astronomical data in order to obtain information required for the publications of the Naval Observatory.
7. Contribute to the advancement of astronomy and navigation by the conduct of research in celestial mechanics and astronomy and the publication of the results thereof.
8. Discharge other responsibilities which may be assigned by the Chief of Naval Operations.

NBS Time and Frequency Responsibilities

Time and Frequency Division (273.00, Institute for Basic Standards). Provides custody and maintenance for NBS frequency and time interval standards and time scales. Conducts fundamental and applied research to establish such standards. Disseminates internationally coordinated frequency and time through radio broadcasts, portable clocks, and other advanced techniques. Engages in research and development on new dissemination techniques that improve accuracy and increase coverage. Develops improved instrumentation for dissemination of time and frequency. Coordinates time and frequency nationally and internationally and provides NBS time scale input to the BIH for formulation of TAI. Conducts fundamental physical research in which the techniques used in time and frequency standards are of critical importance. Disseminates information through consultation and publication.

a. Atomic Frequency and Time Standards Program Areas (273.00). Provides atomic frequency standards for the United States and develops and improves such standards. Provides, develops, and improves atomic time scales based on the frequency standards, and evaluates such time scales for consideration as a standard. Pursues fundamental research to maintain state of the art expertise in frequency standard and time scale work. Furnishes time and frequency signals to other Boulder Laboratory activities. Performs frequency and time calibration services for science, industry, commerce, and government users who require reference to the national standards.

b. Frequency-Time Dissemination Research Section (273.01). Conducts research and development on new and improved methods of dissemination of frequency and time standards including satellites, television, very low frequency (VLF), portable clocks, and other advanced techniques; investigates propagation errors of time signals; provides consultation on methods of frequency and time dissemination; compares and evaluates methods of frequency and time dissemination; and makes recommendations for improvements in monitoring techniques and other mission components.

c. Frequency-Time Broadcast Services Section (273.02). Provides wide dissemination of frequency and time standards primarily by radio broadcasts; investigates and develops techniques for improving the accuracy with which frequency and time can be distributed by broadcasting electromagnetic signals; measures distortion involved in the radio broadcast of time and frequency standards, particularly with regard to electronic transmitting and receiving equipment; provides consultation relative to the frequency and time broadcast services; evaluates the effectiveness of the frequency and time broadcast services; recommends improvement or modification of existing services or additions of new services; and monitors frequency and time broadcasts from various sources.

From time to time and National Bureau of Standards, in cooperation with the National Research Council, offers postdoctoral research awards for study in a broad spectrum of interests in basic and applied science, engineering and technology involving many disciplines. Currently there are four specific research areas in the Time and Frequency Division [40] as follows:

1. Fundamental Noise Studies in Frequency Standards,
2. New Quantum Electronic Frequency Standards,
3. Statistical Control and the Theory of Measurement,
4. The Unified Time-Length Standard.

August 31, 1971
NUMBER 5160.51



ATSD(T)

Department of Defense Directive

SUBJECT Precise Time and Time Interval (PTTI) Standards and Calibration Facilities for Use by Department of Defense Components

- Refs.: (a) DoD Directive 5160.51, "Time and Time Interval Standards and Calibration Facilities for Use by Department of Defense Components," February 1, 1965 (hereby cancelled)
- (b) DoD Instruction 4630.4, "Support and Management Services for Precise Time and Time Interval Standards," June 22, 1966 (hereby cancelled)
- (c) DoD Directive 4000.19, "Basic Policies and Principles for Interservice and Interdepartmental Logistic Support," August 5, 1967

I. REISSUANCE

This Directive reissues reference (a) and consolidates references (a) and (b) which are hereby cancelled. Revisions occasioned by organizational and administrative changes are also included. There are no substantive changes.

II. PURPOSE AND APPLICABILITY

This Directive establishes policy and assigns responsibility to a single Department of Defense Component for establishing, coordinating, and maintaining capabilities for time and time interval (astronomical and atomic) for use by all DoD Components, DoD contractors, and related scientific laboratories.

III. DEFINITIONS

For purposes of this Directive, the following definitions will apply.

(U) (S) (C)

Action: *14B6*R S # *14B6*

Continuation of III.

- A. Time signifies epoch, that is, the designation of an instant on a selected time scale, astronomical or atomic. It is used in the sense of time of day.
- B. Time Interval indicates the duration of a segment of time without reference to when the time interval begins and ends. Time interval may be given in seconds of time.
- C. Standards signifies the reference values of time and time interval. These standards are determined by astronomical observation and by the operation of atomic clocks. They are disseminated by transport of clocks, radio transmissions, and by other means.
- D. Precise Frequency signifies a frequency requirement to within one part in 10^9 of an established time scale.
- E. Precise Time signifies a time requirement within ten milliseconds.

IV. POLICY

- A. Resources for uniform and standard time and time interval operations and research shall be the responsibility of a single DoD Component.
- B. The maximum practicable interchange of time and time interval information shall be effected throughout the DoD.
- C. Maximum practical utilization of interservice support will be achieved as prescribed in reference (c).

V. RESPONSIBILITIES

- A. The U. S. Naval Observatory (hereafter referred to as the "Observatory") is assigned the responsibility for insuring:
 - 1. Uniformity in precise time and time interval operations including measurements.
 - 2. The establishment of overall DoD requirements for time and time interval.

Continuation of V.

3. The accomplishment of objectives requiring precise time and time interval with minimum cost.
- B. In carrying out the above responsibilities, the Observatory shall:
1. Derive and maintain standards of time and time interval, both astronomical and atomic.
 2. Provide coordination of such standards with recognized national and international standards to insure world-wide continuity of precision.
 3. Monitor conferences concerning time and time interval standards.
 4. Advise and provide guidance to DoD Components, contractors, and scientific laboratories on matters concerning time and time interval, and their measurement.
- C. All DoD Components which require, utilize, or distribute time and time interval information or have a need for a specific time scale shall:
1. Refer time and time interval to the standards established by the Observatory.
 2. Maintain specific time scales such that relationship to the standard established by the Observatory is known.
 3. Prescribe technical requirements for the coordination of techniques, procedures and periodic calibrations of systems.
 4. Promote economy by prescribing requirements for precise time that are consistent with operational and research needs for accuracy.

VI. DELINEATION OF FUNCTIONS

- A. The Observatory is the single DoD Component responsible for PTTI management control functions. This responsibility encompasses overall activities requiring time to within ten milliseconds and frequency to within one part in 10^9 of an established time scale. In carrying out these PTTI functions on a common-servicing basis, the Observatory will:
1. Issue detailed information concerning reference values for PTTI and distribute them by means of controlled radio transmissions and portable atomic clocks.
 2. Promote (a) operational uniformity of PTTI functions, including measurements; (b) establishment of overall DoD PTTI requirements; and (c) accomplishment of objectives requiring PTTI at minimum cost.
 3. Monitor DoD research programs concerning PTTI (frequency), in coordination with the Office of the Director of Defense Research and Engineering.
 4. Review (a) existing and future PTTI (frequency) requirements of the DoD user components in order to establish overall DoD requirements and to provide adequate supporting services; and (b) existing PTTI operations conducted by DoD user components to provide guidance and recommendations to the Assistant to the Secretary of Defense (Telecommunications).
 5. Establish relationships between the DoD and other Federal Government agencies on PTTI matters.
 6. Provide advice and guidance concerning requests for unilateral PTTI (frequency) programs at the direction of Assistant to the Secretary of Defense (Telecommunications).
 7. Participate in PTTI policy negotiations between the DoD and other Federal Government agencies and international organizations.

Continuation of VI. A.

8. Maintain records of PTTI (frequency) arrangements between the DoD and its contractors and other Federal Government agencies, with the exception of radio frequency assignments.

B. DoD User Components

1. DoD Components presently conducting Precise Time and Time Interval operations and research may continue these activities unless otherwise instructed by the Assistant to the Secretary of Defense (Telecommunications).
2. The Military Departments will assist the Observatory by (a) providing technical information on current and prospective programs involving PTTI applications; and (b) distributing, monitoring and controlling PTTI services on request, subject to the provisions of this Directive and the availability of funds.

C. DoD User Components and contractors will:

1. Consult the Observatory on any technical and logistic problems arising from obtaining a particular accuracy through radio transmissions and portable atomic clocks.
2. Use DoD-controlled transmissions to the maximum extent practicable. Other transmissions of time and frequency which have been coordinated with the Observatory may be used when DoD transmissions do not provide adequate coverage.
3. Refer measurements and contract specifications to DoD standards determined by the Observatory.
4. Use techniques and procedures described in information documents issued by the Observatory in all cases where such documents satisfy the need.
5. Notify the Observatory of:
 - a. Existing and planned PTTI requirements, including information as to accuracy and stability of needs,


Continuation of VI.C.5.a.

measurement techniques planned or in operation,
and continuity of service required of the applicable
distribution transmission.

- b. PTTI (frequency) arrangements between DoD user
components and contractors and other Federal
Government agencies (see paragraph VI.A.8. above);
and
 - c. Scheduled scientific and technical meetings on PTTI
(frequency).
6. Consult the Observatory prior to entering into contracts
for equipment, research, studies, or services involving
PTTI (frequency) in order that maximum use of existing
facilities may be assured.

VII. EFFECTIVE DATE AND IMPLEMENTATION

This Directive is effective immediately. It shall be given full
distribution by all DoD Components. Two copies of each
implementing document shall be forwarded to the ATSD(T)
within 90 days.



Deputy Secretary of Defense



DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON, D. C. 20350

IN REPLY REFER TO
OPNAVINST 4120.4
NAVOBSY

6 JUN 1972

OPNAV INSTRUCTION 4120.4

From: Chief of Naval Operations

Subj: Precise Time and Time Interval (PTTI) Standards and Calibration Facilities for use by Department of the Navy

Ref: (a) DoD Directive 5160.51 of 31 Aug 1971 (NOTAL)
(b) SECNAV Instruction 4355.11B of 16 Jul 1969 (NOTAL)

1. Purpose. To implement reference (a) within the Department of the Navy.
2. Scope and Applicability. The scope of this instruction includes: the generation of operational and research requirements for PTTI (frequency); the establishment, coordination, maintenance, distribution, and utilization of standard values for time and frequency; and the coordination of the Department of the Navy with other components of the Department of Defense with respect to precise time and frequency operations, techniques, procedures, measurements, and calibrations.
3. Definitions. For purposes of this instruction, the following definitions will apply:
 - a. Time signifies epoch, that is, the designation of an instant on a selected time scale, astronomical or atomic. It is used in the sense of time of day or date.
 - b. Time Interval indicates the duration of a segment of time without reference to when the time interval begins and ends. Time interval may be given in seconds of time.
 - c. Standards signify the reference values of time and time interval. These standards are determined by astronomical observation and by the operation of atomic clocks. They are disseminated by transport of clocks, radio transmissions, and by other means.
 - d. Precise Frequency signifies a frequency requirement to within one part in 10^9 of an established time scale.
 - e. Precise Time signifies a time requirement within ten milliseconds.

6 June 1977

4. Policy

a. The epoch and the interval of time (frequency) as determined by the U. S. Naval Observatory (NAVOBSY) shall be utilized as standards within the Department of the Navy.

b. Designated Department of the Navy facilities and systems which are capable of distributing precise time or frequency information, such as radio communications, satellites, and radio navigation systems, shall transmit the standards determined by the NAVOBSY.

c. Addressees requiring precise time and frequency shall make their requirements known to the Superintendent, NAVOBSY or the Chief of Naval Material (CNM), and shall obtain guidance as appropriate in preparing Specific Operational Requirements (SOR), Advanced Development Objectives (ADO), Proposed Technical Approaches (PTA), Technical Development Plans (TDP), and similar planning instruments.

d. Organizations with future requirements for precision or geographic coverage exceeding those provided by existing distribution systems shall make these requirements known to the Superintendent, NAVOBSY.

5. Responsibilities

a. The NAVOBSY is assigned the responsibility for insuring uniformity in PTTI (frequency) operations for DoD including measurements. The CNM is responsible for assuring this uniformity within the Department of the Navy.

b. The CNM is assigned the responsibility for insuring:

(1) The establishment of overall Department of the Navy requirements for time and time interval.

(2) The accomplishment of objectives requiring PTTI (frequency) with minimum cost.

c. In carrying out the above responsibilities,

(1) The NAVOBSY shall:

(a) Derive and maintain standards of time and time interval, both astronomical and atomic.

6 June 1972

(b) Provide coordination of such standards with recognized national and international standards to insure worldwide continuity of precision.

(c) Issue detailed information concerning reference values of PTTI (frequency) and distribute them by means of controlled radio transmissions, portable atomic clocks, and other appropriate means.

(d) Establish relationships between the Department of the Navy and other DoD agencies on PTTI (frequency) matters.

(e) Provide advice and assistance as required.

(2) The CNM shall:

(a) Sponsor and monitor conferences concerning time and time interval standards in coordination with the NAVOBSY.

(b) Advise and provide guidance to Department of the Navy components, contractors, and scientific laboratories on matters concerning time and time interval, and their measurement.

(c) Prescribe technical requirements for the coordination of techniques, procedures, and periodic calibration of systems.

d. All Department of the Navy components which require, utilize, or distribute time and time interval information or have a need for a specific time scale shall:

(1) Refer time and time interval to the standards established by the NAVOBSY.

(2) Maintain specific time scales such that relationship to the standard established by the NAVOBSY is known.

(3) Promote economy by prescribing requirements for precise time that are consistent with operational and research needs for accuracy.

6. Delineation of Functions

a. The CNM is the single Department of the Navy manager responsible for PTII (frequency) management control functions. This responsibility encompasses overall activities requiring time to within ten milliseconds and frequency to within one part in 10^3 of an established time scale. In carrying out these PTII (frequency) functions, the CNM will:

(1) Promote (a) operational uniformity of PTII (frequency) functions; and (b) establishment of overall Department of the Navy PTII (frequency) requirements.

(2) Monitor Department of the Navy research programs concerning PTII (frequency), in coordination with the NAVOBSY.

(3) Sponsor Department of the Navy research and development programs for PTII (frequency) and PTII applications, in coordination with the NAVOBSY.

(4) Review (a) existing and future PTII (frequency) requirements of the Department of the Navy user components in order to establish overall Department of the Navy requirements and to provide adequate supporting services; and (b) existing PTII (frequency) operations conducted by Department of the Navy user components to provide guidance and recommendations to the NAVOBSY.

(5) Provide training, maintenance, repair, and calibration services for Department of the Navy PTII (frequency) equipment and systems.

(6) Provide advice and guidance concerning requests for unilateral PTII (frequency) programs at the direction of the NAVOBSY.

(7) Participate in PTII (frequency) policy negotiations in coordination with the NAVOBSY, between the Department of the Navy and other DoD agencies.

(8) Maintain records of PTII (frequency) arrangements between the Department of the Navy and its contractors, with the exception of radio frequency assignments.

b. Department of the Navy user components will assist the CNM by (1) providing technical information on current and prospective programs involving PTII (frequency) applications; and (2) distributing, monitoring, and controlling PTII (frequency) services on request.

c. Department of the Navy User Components and Contractors will:

(1) Consult the CNM on any technical and logistic problems arising from PTTI (frequency) operations or research.

(2) Use DoD-controlled transmissions to the maximum extent practicable. Other transmissions of time and frequency which have been coordinated with the NAVOBSY may be used when DoD transmissions do not provide adequate coverage.

(3) Refer measurements and contract specifications to DoD standards determined by the NAVOBSY.

(4) Use techniques and procedures described in information documents issued by the NAVOBSY in all cases where such documents satisfy the need.

(5) Notify the CNM of existing and planned PTTI (frequency) requirements, including information as to accuracy and stability of needs, measurement techniques planned or in operation, and continuity of service required of the applicable distribution transmission.

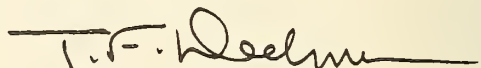
(6) Consult the CNM prior to entering into contracts for equipment, research, studies, or services involving PTTI (frequency) in order that maximum use of existing facilities may be assured.

7. Action

a. The Chief of Naval Operations (CNO) designates and places operational requirements upon those naval facilities and systems which will transmit the time and frequency standards determined by the NAVOBSY. The CNO also provides and maintains suitable facilities for the NAVOBSY to carry out the responsibilities assigned.

b. The CNM, as directed by the CNO and in accordance with reference (b), will coordinate compliance, as necessary.

DISTRIBUTION:
See page 6.



T.F. DEDMAN
Assistant Vice Chief of Naval Operations
Director of Naval Administration

APPENDIX F

U. S. NAVAL OBSERVATORY
WASHINGTON, D.C. 20390

17 April 1968

TIME SERVICE ANNOUNCEMENT, Series 14

NO. 1

U. S. Naval Observatory Time Reference Stations

1. Precise time measurements against the Master Clock maintained by the U. S. Naval Observatory in Washington, D.C., may also be made at the locations listed below. Reference atomic clocks have been set up, or designated at these locations, and their time differences with the U. S. Naval Observatory Master Clock are measured regularly and are known to an accuracy of better than ± 2.5 microseconds.

Present locations of Time Reference Stations:

Master Clock:

U. S. Naval Observatory
Time Service Division
Washington, D. C. 20390

Tel: AUTOVON
Commercial: 202 696-8423
TWX: 710 822 1970

Time Reference Stations:

(a) National Bureau of Standards
Boulder, Colorado

Tel: FTS
Commercial: 303 449-1000
TWX:

(b) U. S. Naval Observatory Time Service Substation
Miami (Perrine), Florida

Tel: Commercial: 305 235-0515
TWX: 305 238 3451

(c) U. S. Navy Astronautics Group
Detachment CHARLIE
Wahiawa, Oahu, Hawaii

Tel: AUTOVON
Commercial: 4315523
TWX:

(d) U. S. Coast Guard Loran Monitoring Station
Building 683
Fuchu Air Station
Fuchu-Shi, Tokyo-To, Japan

Tel: AUTOVON
Commercial: 45700 or 47188
TWX:

(e) Hewlett Packard Company
Palo Alto, California

Tel: Commercial: 415 326-7000
TWX: HEWPACK

(f) Hewlett Packard Company
Geneva, Switzerland

Tel: Commercial: 022 42.81.50
TWX: HEWPACKSA

2. Recent measurements are reported in the U. S. Naval Observatory Phase Value Bulletins and messages.

3. For further information, contact the:

Superintendent
U. S. Naval Observatory
Washington, D. C. 20390

J. M. McDOWELL
Superintendent

U. S. NAVAL OBSERVATORY
WASHINGTON, D.C. 20390

8 October 1968

TIME SERVICE ANNOUNCEMENT, SERIES 14

NO. 3

Coordination of Clock Time Scales

1. In the interest of improved coordination between the National Bureau of Standards, the U. S. Naval Observatory, and international timekeeping centers, the frequency of the U. S. Naval Observatory clock time scales was lowered 4 parts in 10^{13} on 1 October 1968 at 0^h UT.
2. Effective 1 October 1968 all daily phase values and clock measurements published by the U. S. Naval Observatory will be given with respect to these improved coordinated time scales. Clocks which were running perfectly with respect to UTC(USNO) before 1 October 1968 will now show an apparent daily rate of 34.56 nanoseconds (fast).
3. For most timing applications this change will be insignificant since it is less than the random fluctuations of individual atomic clocks.

J. MAURY WERTH
Superintendent

NBS Time and Frequency Publication Services*

1. Publishes a monthly Time and Frequency Services Bulletin. Typical table of contents as follows:
 1. TIME SCALE INFORMATION*
Relations of some time scales to the AT(NBS) and UTC(NBS) Time Scales.
 2. ADJUSTMENTS IN NBS BROADCAST TIME PULSES
Listed are adjustments in broadcast time pulses dated from 1 January 1972. Notices of future adjustments will be made when they are available from the BIH. These adjustments are made to maintain the broadcast pulses within about ± 0.7 seconds of the UT1 scale. The UT1 scale is slightly non-uniform due to variations in the rotation of the earth about its axis.
 3. DAILY PHASE DEVIATIONS FOR NBS STATIONS*
Day-by-day transmitted phase deviations measured from 1800 UTC to 1800 UTC, referred to the UTC(NBS) time marker, are listed for station WWVB. General time and frequency information is listed for stations WWV and WWVF.
 4. PHASE DEVIATIONS FOR NON-NBS STATIONS*
Listed are day-by-day phase deviations measured with respect to the UTC(NBS) time marker and obtained by monitoring non-NBS stations.
 - 5A. OUTAGES OF NBS RADIO BROADCASTS
Interruptions in service from NBS radio stations.
 - 5B. SCHEDULED OUTAGES OR ALTERATIONS IN NBS RADIO BROADCASTS
Advance notice of scheduled interruptions or changes in service.
 - 6A. DAILY TELEVISION TIME TRANSFER MEASUREMENTS
Daily readings for the three major U. S. networks of the difference between UTC(NBS) and the trailing edge of the next line 10 (odd) horizontal synchronization pulse as received in Boulder, Colorado.
 - 6B. DAILY TELEVISION FREQUENCY TRANSFER MEASUREMENTS*
Listed are the average fractional frequencies with respect to the NBS primary frequency standard for each of the three rubidium gas cell frequency standards used at each of the corresponding major network originating studios.
 7. EXPLANATION OF TIME SCALES AND DEFINITIONS OF TERMS
(not in every issue) - The NBS Time Scales--their derivation and relation to each other and to those of other laboratories. Definitions of all terms used in this bulletin.
 8. NOTES (not in every issue)
Corrections, additions, deletions and special announcements.

*The sign convention used in this bulletin follows the recommendations of the CCIR.
 2. Sends advance notice of revisions to NBS standard frequency broadcasts to users on basis of need.
 3. Periodically sends a bibliographic listing of NBS published documents pertaining to frequency and time standards or related metrology to interested users.
 4. Services a mailing list for current scientific and technical publications maintained in Atomic Frequency and Time Standards Program Area, and forwards reprints as they become available.
- * Available upon request to NBS Time and Frequency Division, National Bureau of Standards, Boulder, Colorado 80302.

USNO Time and Frequency Publications*

A. Publishes Time Service Publications [41] as follows:

<u>Series</u>	<u>Title</u>
1.	<u>List of Worldwide VLF and HF Transmissions</u> suitable for Precise Time Measurements. Includes: Call sign, geographic location, frequencies, radiated power, etc. (Time Signal Transmissions).
2.	<u>Schedule of U.S. Navy Time Signal Transmissions in VLF and HF bands.</u> Includes: Times of broadcast, frequencies, etc.
3.	<u>Schedule of U.S. Navy VLF Transmissions</u> including Omega system. Includes: Location, frequencies, power radiated, maintenance periods, type of transmission, etc.
4.	<u>Daily Relative Phase Values</u> (issued weekly). Includes: Observed phase and time differences between VLF, LF, Omega, Television, Portable Clock measurements, and Loran-C stations and the UTC(USNO Master Clock). Propagation disturbances are also given.
5.	<u>Daily Teletype Messages</u> (sent every working day). Includes: Daily relative phase and time differences between UTC(USNO MC) and VLF, LF, Omega, Loran-C stations. Propagation disturbances and notices of immediate concern for precision timekeeping.
6.	<u>USNO A.1 - UT1 Data.</u> Preliminary daily values distributed monthly with final data issued as available.
7.	<u>Preliminary Times and Coordinates of the Pole</u> (issued weekly). Includes: General time scale information; UT1 - UTC predicted 2 weeks in advance; time difference between A.1, UT1, UT2, UTC(BIH) and UTC(USNO) provisional coordinates of the pole; PUT1 value; and satellite information.
8.	<u>Time Service Announcements</u> pertaining to synchronization by television. Includes: Times of coincidence (NULL) ephemeris tables.
9.	<u>Time Service Announcements Pertaining to Loran-C.</u> Includes: Change in transmissions and repetition rates, times of coincidence (NULL) ephemeris tables, coordinates and emission delays, general information, etc.
10.	<u>Astronomical Programs</u> (issued when available). Includes: Information pertaining to results, catalogs, papers, etc., of the Photographic Zenith Tube (PZT), Danjon Astrolabe, and Dual-Rate Moon Position Camera.
11.	<u>Time Service Bulletins.</u> Includes: Time differences between coordinated stations and the UTC Time Scale; earth's seasonal and polar variations (as observed at Washington and Florida); Provisional coordinates of the pole; adopted UT2 - A.1, etc.
12.	Time Service Internal Mailing.
13.	Time Service Internal Mailing.
14.	<u>Time Service General Announcements.</u> Includes: General information pertaining to time determination, measurement, and dissemination. Should be of interest to all Time Service Addressees.
15.	<u>Bureau International de l'Heure (BIH) Circular D: Heure Definitive et Coordonnees du Pole a 0^h TU.</u> Includes: Coordinates of the pole; UT2 - UTC, UT1 - UTC, and TA(AT) - UTC; UTC - Signal. NOTE: USNO Time Service will distribute Circular D of the BIH to U.S. addressees only.
16.	<u>Communication Satellite Reports</u> giving the differences UTC(USNO) - SATCOM Clock for each of the available SATCOM stations.
17.	<u>Transit Satellite Reports.</u> Includes: Satellite Clock - UTC(USNO) and the frequency offset for each of the operational satellites.

B. Publishes Proceedings of Annual PTTI Meetings [27].

* Available upon request to Director, Time Service Division, USNO, Washington, DC 20390.

APPENDIX F

Second. The custody of the international prototypes.

Third. The periodical comparison of the national standards with the international prototypes and with their test copies, as well as comparisons of the standard thermometers.

Fourth. The comparison of the prototypes with the fundamental standards of nonmetrical weights and measures used in different countries for scientific purposes.

Fifth. The sealing and comparison of geodesic measuring bars.

Sixth. The comparison of standards and scales of precision, the verification of which may be requested by governments or by scientific societies, or even by constructors or men of science.

Art. 7. After the committee shall have proceeded with the work of coordinating the measures relative to electric units and when the general conference shall have so decided by a unanimous vote, the bureau will have charge of the establishment and keeping of the standards of the electric units and their test copies and also of comparing with those standards, the national or other standards of precision.

The bureau is also charged with the duty of making the determinations relative to physical constants, a more accurate knowledge of which may be useful in increasing precision and further insuring uniformity in the provinces to which the above-mentioned units belong (article 6 and first paragraph of article 7).

It is finally charged with the duty of coordinating similar determinations effected in other institutions.

Art. 8. The international prototypes and standards and also their test copies shall be deposited in the bureau; access to the deposit shall be solely reserved for the international committee.

Art. 9. The entire expense of the construction and outfit of the international bureau of weights and measures, together with the annual cost of its maintenance and the expenses of the committee, shall be defrayed by contributions from the contracting states, the amount of which shall be computed in proportion to the actual population of each.

Art. 10. The amounts representing the contributions of each of the contracting States shall be paid at the beginning of each year, through the ministry of foreign affairs of France, into the *Caisse de dépôts et consignations* at Paris, whence they may be drawn as occasion may require, upon the order of the director of the bureau.

Art. 11. Those Governments which may take advantage of the privilege, open to every State, of acceding to this convention shall be required to pay a contribution, the amount of which shall be fixed by the committee on the basis established in article 9, and which shall be devoted to the improvement of the scientific apparatus of the bureau.

Art. 12. The high contracting parties reserve to themselves the power of introducing into the present convention, by common consent, any modifications the propriety of which may have been shown by experience.

Art. 13. At the expiration of twelve years this convention may be abrogated by any one of the high contracting parties, so far as it is concerned.

Any Government which may avail itself of the right of terminating this convention, so far as it is concerned, shall be required to give notice of its intentions one year in advance, and by so doing shall renounce all rights of joint ownership in the international prototypes and in the bureau. • • •

Appendix No. 1, Regulations.

Article 1. The international bureau of weights and measures shall be established in a special building, possessing all the necessary safeguards of stillness and stability.

It shall comprise, in addition to the vault, which shall be devoted to the safe-keeping of the prototypes, rooms for mounting the comparators and balances; a laboratory, a library, a room for the archives, workrooms for the employés, and lodgings for the watchmen and attendants.

Art. 2. It shall be the duty of the international committee to acquire and fit up the aforesaid building and to set in operation the work for which it was designed.

In case of the committee's inability to obtain a suitable

Metric Convention: Signed at Paris, May 20, 1875; ratification advised by the Senate, May 15, 1878; ratified by the President, May 28, 1878; ratifications exchanged, August 2, 1878; proclaimed, September 27, 1878. As amended by the convention signed at Sevres, October 6, 1921; ratification advised by the Senate, January 5, 1923; ratified by the President, September 19, 1923; ratification of the United States, deposited with the Government of the French Republic, October 24, 1923; proclaimed, October 27, 1923.

His Excellency the President of the United States of America, His Majesty the Emperor of Germany, His Majesty the Emperor of Austria-Hungary, His Majesty the King of the Belgians, His Majesty the Emperor of Brazil, His Excellency the President of the Argentine Confederation, His Majesty the King of Denmark, His Majesty the King of Spain, His Excellency the President of the French Republic, His Majesty the King of Italy, His Excellency the President of the Republic of Peru, His Majesty the King of Portugal and the Algarves, His Majesty the Emperor of all the Russias, His Majesty the King of Sweden and Norway, His Excellency the President of the Swiss Confederation, His Majesty the Emperor of the Ottomans, and His Excellency the President of the Republic of Venezuela, desiring international uniformity and precision in standards of weight and measure, have resolved to conclude a convention to this effect, and have named as their plenipotentiaries the following: • • •

Who, after having exhibited their full powers, which were found to be in good and due form, have agreed upon the following articles:

Article 1. The high contracting parties engage to establish and maintain, at their common expense, a scientific and permanent international bureau of weights and measures, the location of which shall be at Paris.

Art. 2. The French Government shall take all the necessary measures to facilitate the purchase, or, if expedient, the construction, of a building which shall be especially devoted to this purpose, subject to the conditions stated in the regulations which are subjoined to this convention.

Art. 3. The operation of the international bureau shall be under the exclusive direction and supervision of an international committee of weights and measures, which latter shall be under the control of a general conference for weights and measures, to be composed of the delegates of all the contracting Governments.

Art. 4. The general conference for weights and measures shall be presided over by the president for the time being of the Paris Academy of Sciences.

Art. 5. The organization of the bureau, as well as the formation and the powers of the international committee, and of the general conference for weights and measures, are established by the regulations subjoined to this convention.

Art. 6. The international bureau of weights and measures shall be charged with the following duties:

First. All comparisons and verifications of the new prototypes of the meter and kilogram.

Federal and State Weights and Measures Laws

building one shall be built under its directions and in accordance with its plans.

Art. 3. The French Government shall, at the request of the international committee, take the necessary measures to cause the bureau to be recognized as an establishment of public utility.

Art. 4. The international committee shall cause the necessary instruments to be constructed, such as comparators for the standards of line and end measures, apparatus for the determination of absolute dilatations, balances for weighing in air and in vacuo, comparators for geodetic measuring bars, etc.

Art. 5. The entire expense incurred in the purchase or construction of the building, and in the purchase and placing of the instruments and apparatus, shall not exceed 400,000 francs.

Art. 6. The annual appropriation for the international bureau consists of two parts, one of which is fixed, the other complementary.

The fixed part is, in principle, 250,000 francs, but on the unanimous vote of the committee may be raised to 300,000 francs. It is borne by all the States and autonomous colonies that adhered to the meter convention before the sixth general conference.

The complementary part is made up of contributions from the States and autonomous colonies that joined the convention after the aforesaid general conference. The committee is charged with the duty of drawing up on the motion of the director the annual budget, but without exceeding the amount computed in accordance with the provisions of the two paragraphs above. The budget is made known every year by means of a special financial report to the Governments of the high contracting parties.

If the committee find it necessary either to increase beyond 300,000 francs the fixed part of the annual appropriation or to modify the computation of the contributions as determined by article 20 of these regulations, it should lay the matter before the Governments so as to enable them to issue in good time the needed instructions to their delegates to the next general conference in order that the said conference may deliberate to good purpose. The decision will stand only in the case that no opposition shall have been expressed before or in the conference by any of the contracting States.

If the State should let three years go without paying its contribution, that contribution shall be divided among the other States proportionally to their own contribution. The additional sum thus paid by the States to make up the whole of the appropriation of the bureau shall be regarded as an advance to the delinquent State and shall be reimbursed to them if that State should make good its arrears. The advantages and prerogatives conferred by adhering to the meter convention are suspended in the case of States that have been delinquent three years.

After three more years the delinquent State shall be expelled from the convention and the reckoning of the contributions restored in accordance with the provisions of article 20 of these regulations.

Art. 7. The general conference mentioned in article 3 of this convention shall be at Paris, upon the summons of the international committee, at least once every six years.

It shall be its duty to discuss and initiate measures necessary for the dissemination and improvement of the metrical system, and to pass upon such new fundamental metrological determinations as may have been made during the time when it was not in session. It shall receive the report of the international committee concerning the work that has been accomplished, and shall replace one-half of the international committee by secret ballot.

The voting in the general conference shall be by States; each State shall be entitled to one vote.

Each of the members of the international committee shall be entitled to a seat at the meetings of the conference. They may at the same time be delegates of their Governments.

Art. 8. The international committee mentioned at article 3 of the convention shall be composed of 18 members all from different States.

At the time of the renewal by halves of the international committee the outgoing members shall be first those who may have been provisionally elected to fill vacancies between two sessions of the conference; the others will be drawn by lot. Outgoing members may be reelected.

Art. 9. The international committee organizes itself by electing by its own secret vote its chairman and secretary. Those appointments are notified to the Governments of the high contracting parties.

The chairman and the secretary of the committee and the director of the bureau must belong to different countries.

Once organized, the committee can not hold other elections or make other appointments until three months shall have elapsed after the notice of a vacancy calling for a vote shall have been given to all the members.

Art. 10. The international committee directs all the metrological works that the high contracting parties shall decide to have carried on jointly.

It is also charged with the duty of seeing to the conservation of the international prototypes and standards.

It may, lastly, institute the cooperation of specialists in questions of metrology and coordinate the results of their work.

Art. 11. The committee shall meet at least once in two years.

Art. 12. The balloting in the committee is by a majority vote; in case of a tie vote the chairman has the casting vote. Decisions are only valid if the members present are at least one half of the elected members forming the committee.

Subject to that condition absent members have a right to delegate their votes to present members who must prove that they have been so delegated. This also applies to appointments by secret ballot.

The director of the bureau is a nonvoting member of the committee.

Art. 13. During the interval occurring between two sessions the committee shall have the right to discuss questions by correspondence.

In such cases, in order that its resolutions may be considered to have been adopted in due form, it shall be necessary for all the members of the committee to have been called upon to express their opinions.

Art. 14. The international committee for weights and measures shall provisionally fill such vacancies as may occur in it; these elections shall take place by correspondence, each of the members being called upon to take part therein.

Art. 15. The international committee will draw up a detailed set of regulations for the organization and work of the bureau and will fix the dues to be paid for the extraordinary works provided by articles 6 and 7 of the convention.

Those dues will be applied to improving the scientific equipment of the bureau. A certain amount may be drawn annually for the retirement fund from the total dues collected by the bureau.

Art. 16. All communications from the international committee to the Governments of the high contracting parties shall take place through the diplomatic representatives of such countries at Paris.

For all matters requiring the attention of the French authorities, the committees shall have recourse to the ministry of foreign affairs of France.

Art. 17. A regulation drawn up by the committee will determine the maximum staff for each category of the personnel of the bureau. The director and his assistants shall be elected by secret ballot by the international committee. Other appointments shall be notified to the Governments of the high contracting parties. The director will appoint the other members of the personnel within the bounds laid by the regulation mentioned in the first paragraph above.

Art. 18. The director of the bureau shall have access to the place where the international prototypes are deposited only in pursuance of a resolution of the committee and in the presence of at least one of its members. The place of deposit of the prototype shall be opened only by means of three keys, one of which shall be in the possession of the director of archives

of France, the second in that of the chairman of the committee, and the third in that of the director of the bureau.

The standards of the class of national prototypes alone shall be used for the ordinary comparing work of the bureau.

Art. 19. The director of the bureau shall annually furnish to the committee: First, a financial report concerning the accounts of the preceding year, which shall be examined, and if found correct, a certificate to that effect shall be given him; second, a report on the condition of the apparatus; third, a general report concerning the work accomplished during the course of the year just closed.

The international committee shall make to each of the Governments of the high contracting parties an annual report concerning all its scientific, technical, and administrative operations, and concerning those of the bureau. The chairman of the committee shall make a report to the general conference concerning the work that has been accomplished since its last session.

The reports and publications of the committee shall be in the French language. They shall be printed and furnished to the Governments of the high contracting parties.

Art. 20. The scale of contributions spoken of in article 9 of the convention is established for its fixed part on the basis of the appropriation referred to in article 6 of the present regulations and of the population; the normal contribution of each State can not be less than five to a thousand nor more than 15 per cent of the whole appropriation, regardless of the population. In order to establish that scale, it shall first be found which are the States that are in the conditions required for the minimum and maximum and the remainder of the quota shall be distributed among the other States in the direct ratio of their population.

The quota thus reckoned stands for the whole time included between two consecutive general conferences and can only be modified in the meanwhile in the following cases:

(a) If one of the adhering States allows three successive years to pass without making its payments;

(b) When, on the contrary, a State which had been previously delinquent for more than three years pays up its arrears, and the occasion arises to return to the other Governments the advances made by them.

The complementary contribution is computed on the same basis of population and is like that which the States that have long belonged to the convention pay under the same conditions.

If after adhering to the convention a State declares it would like to extend the benefits thereof to one or more of its colonies that are not autonomous, the number of the population of the said colonies would be added to that of the State in reckoning the scale of contributions.

When a colony that is recognized as autonomous shall desire to adhere to the convention, it will be regarded with respect to its admission into the convention and as the mother country may decide, either as a dependency of that mother country or as a contracting State.

Art. 21. The expense of constructing the international prototypes and the standards and test copies which are to accompany them shall be defrayed by the high contracting parties in accordance with the scale fixed in the foregoing article.

The amounts to be paid for the comparison and verification of standards required by States not represented at this convention shall be regulated by the committee in conformity with the rates fixed in virtue of article 15 of the regulations.

Art. 22. These regulations shall have the same force and value as the convention to which they are annexed. * * *

On January 2, 1890, "meter No. 27" and "kilogram No. 20", being copies of the international prototype meter and kilogram preserved at the International Bureau of Weights and Measures, were opened at the White House and accepted by President Harrison as national standards. Duplicates of these, being "meter No. 21" and "kilogram No. 4", were received later in the same year. These standards were

given into the custody of the Office of Standard Weights and Measures of the Coast and Geodetic Survey of the Treasury Department.

In 1893 a ruling of fundamental importance with respect to standards was made by T. C. Mendenhall, the Superintendent of Standard Weights and Measures. This ruling, which subsequently came to be known as the "Mendenhall Order", was approved April 5, 1893, by the Secretary of the Treasury; its essential part is as follows:

Bulletin No. 26, "Fundamental Standards of Length and Mass", United States Coast and Geodetic Survey, Treasury Department, April 5, 1893.

* * * the Office of Weights and Measures, with the approval of the Secretary of the Treasury, will in the future, regard the International Prototype Metre and Kilogramme as fundamental standards, and the customary units, the yard and the pound, will be derived therefrom in accordance with the Act of July 28, 1866. * * *

Bulletin No. 26 also carried a "Note", as follows:

NOTE.—Reference to the Act of 1866, results in the establishment of the following:

Equations

$$1 \text{ yard} = \frac{3600}{3937} \text{ metre.}$$

$$1 \text{ pound avoirdupois} = \frac{1}{2.2046} \text{ kilo.}$$

A more precise value of the English pound avoirdupois is

$$\frac{1}{2.20462} \text{ kilo.,}$$

differing from the above by about one part in one hundred thousand, but the equation established by law is sufficiently accurate for all ordinary conversions.

As already stated, in work of high precision the kilogramme is now all but universally used and no conversion is required.

The National Bureau of Standards continues to consider the relation

$$1 \text{ yard} = \frac{3600}{3937} \text{ meter}$$

which may also be expressed

$$1 \text{ meter} = 39.37 \text{ inches}$$

as an exact equivalent. In the case of the relation between the avoirdupois pound and the kilogram, however, the National Bureau of Standards now recognizes as the fundamental relation

$$1 \text{ avoirdupois pound} = 0.453\,592\,427\,7 \text{ kilogram}$$

which corresponds with

$$1 \text{ kilogram} = 2.204\,622\,341 \text{ avoirdupois pounds.}$$

APPENDIX G



Public Law 89-387
89th Congress, S. 1404
April 13, 1966

An Act

To promote the observance of a uniform system of time throughout the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Uniform Time Act of 1966".

Uniform Time
Act of 1966.

Sec. 2. It is the policy of the United States to promote the adoption and observance of uniform time within the standard time zones prescribed by the Act entitled "An Act to save daylight and to provide standard time for the United States", approved March 19, 1918 (40 Stat. 450; 15 U.S.C. 261-264), as modified by the Act entitled "An Act to transfer the Panhandle and Plains section of Texas and Oklahoma to the United States standard central time zone", approved March 4, 1921 (41 Stat. 1446; 15 U.S.C. 265). To this end the Interstate Commerce Commission is authorized and directed to foster and promote widespread and uniform adoption and observance of the same standard of time within and throughout each such standard time zone.

Sec. 3. (a) During the period commencing at 2 o'clock antemeridian on the last Sunday of April of each year and ending at 2 o'clock antemeridian on the last Sunday of October of each year, the standard time of each zone established by the Act of March 19, 1918 (15 U.S.C. 261-264), as modified by the Act of March 4, 1921 (15 U.S.C. 265), shall be advanced one hour and such time as so advanced shall for the purposes of such Act of March 19, 1918, as so modified, be the standard time of such zone during such period; except that any State may by law exempt itself from the provisions of this subsection providing for the advancement of time, but only if such law provides that the entire State (including all political subdivisions thereof) shall observe the standard time otherwise applicable under such Act of March 19, 1918, as so modified, during such period.

(b) It is hereby declared that it is the express intent of Congress by this section to supersede any and all laws of the States or political subdivisions thereof insofar as they may now or hereafter provide for advances in time or changeover dates different from those specified in this section.

(c) For any violation of the provisions of this section the Interstate Commerce Commission or its duly authorized agent may apply to the district court of the United States for the district in which such violation occurs for the enforcement of this section; and such court shall have jurisdiction to enforce obedience thereto by writ of injunction or by other process, mandatory or otherwise, restraining against further violations of this section and enjoining obedience thereto. Violations.
80 STAT. 107.
80 STAT. 108.

Sec. 4. (a) The first section of the Act of March 19, 1918, as amended (15 U.S.C. 261), is amended to read as follows:

"That for the purpose of establishing the standard time of the United States, the territory of the United States shall be divided into eight zones in the manner provided in this section. Except as provided in section 3(a) of the Uniform Time Act of 1966, the standard time of the first zone shall be based on the mean solar time of the

Standard time
zones.

"Interstate or foreign commerce."

15 USC 262.

Designations.

60 Stat. 237.

Effective date.

sixtieth degree of longitude west from Greenwich; that of the second zone on the seventy-fifth degree; that of the third zone on the ninetyeth degree; that of the fourth zone on the one hundred and fifth degree; that of the fifth zone on the one hundred and twentieth degree; that of the sixth zone on the one hundred and thirty-fifth degree; that of the seventh zone on the one hundred and fiftieth degree; and that of the eighth zone on the one hundred and sixty-fifth degree. The limits of each zone shall be defined by an order of the Interstate Commerce Commission, having regard for the convenience of commerce and the existing junction points and division points of common carriers engaged in interstate or foreign commerce, and any such order may be modified from time to time. As used in this Act, the term 'interstate or foreign commerce' means commerce between a State, the District of Columbia, the Commonwealth of Puerto Rico, or any possession of the United States and any place outside thereof."

(b) Section 2 of such Act is amended to read as follows:

"Sec. 2. Within the respective zones created under the authority of this Act the standard time of the zone shall insofar as practicable (as determined by the Interstate Commerce Commission) govern the movement of all common carriers engaged in interstate or foreign commerce. In all statutes, orders, rules, and regulations relating to the time of performance of any act by any officer or department of the United States, whether in the legislative, executive, or judicial branches of the Government, or relating to the time within which any rights shall accrue or determine, or within which any act shall or shall not be performed by any person subject to the jurisdiction of the United States, it shall be understood and intended that the time shall insofar as practicable (as determined by the Interstate Commerce Commission) be the United States standard time of the zone within which the act is to be performed."

(c) Section 4 of such Act is amended to read as follows:

"Sec. 4. The standard time of the first zone shall be known and designated as Atlantic standard time; that of the second zone shall be known and designated as eastern standard time; that of the third zone shall be known and designated as central standard time; that of the fourth zone shall be known and designated as mountain standard time; that of the fifth zone shall be known and designated as Pacific standard time; that of the sixth zone shall be known and designated as Yukon standard time; that of the seventh zone shall be known and designated as Alaska-Hawaii standard time; and that of the eighth zone shall be known and designated as Bering standard time."

SEC. 5. The Administrative Procedure Act (5 U.S.C. 1001-1011) shall apply to all proceedings under this Act, the Act of March 19, 1918 (15 U.S.C. 261-264), and the Act of March 4, 1921 (15 U.S.C. 265).

SEC. 6. This Act shall take effect on April 1, 1967: except that if any State, the District of Columbia, the Commonwealth of Puerto Rico, or any possession of the United States, or any political subdivision thereof, observes daylight saving time in the year 1966, such time shall advance the standard time otherwise applicable in such place by one hour and shall commence at 2 o'clock antemeridian on the last

80 STAT. 109

Sunday in April of the year 1966 and shall end at 2 o'clock antemeridian on the last Sunday in October of the year 1966.

SEC. 7. As used in this Act, the term "State" includes the District of Columbia, the Commonwealth of Puerto Rico, or any possession of the United States.

Approved April 13, 1966.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 1315 accompanying H. R. 6785 (Comm. on Interstate & Foreign Commerce) and No. 1385 (Comm. of Conference).

SENATE REPORT No. 268 (Comm. on Commerce).

CONGRESSIONAL RECORD:

Vol. 111 (1965): June 3, considered and passed Senate.
Mar. 16, considered and passed House, amended,
in lieu of H. R. 6785.
Mar. 22, Senate concurred in House amendment
with amendments.
Mar. 29, Senate agreed to conference report.
Mar. 30, House agreed to conference report.

STANDARD TIME

§ 260. Congressional declaration of policy; adoption and observance of uniform standard of time; authority of Secretary of Transportation.

It is the policy of the United States to promote the adoption and observance of uniform time within the standard time zones prescribed by sections 261 to 264 of this title, as modified by section 265 of this title. To this end the Secretary of Transportation is authorized and directed to foster and promote widespread and uniform adoption and observance of the same standard of time within and throughout each such standard time zone. (Pub. L. 89-387, § 2, Apr. 13, 1966, 80 Stat. 107.)

EFFECTIVE DATE

Section 6 of Pub. L. 89-387 provided that: "This Act [which enacted sections 260, 260a, 266, and 267 of this title and amended sections 261-263 of this title] shall take effect on April 1, 1967; except that if any State, the District of Columbia, the Commonwealth of Puerto Rico, or any possession of the United States, or any political subdivision thereof, observes daylight saving time in the year 1966, such time shall advance the standard time otherwise applicable in such place by one hour and shall commence at 2 o'clock antemeridian on the last Sunday in April of the year 1966 and shall end at 2 o'clock antemeridian on the last Sunday in October of the year 1966."

SHORT TITLE

Section 1 of Pub. L. 89-387 provided: "That this Act [which enacted sections 260, 260a, 266, and 267 of this title, and amended sections 261-263 of this title, and enacted provisions set out as notes under this section] may be cited as the 'Uniform Time Act of 1966'."

TRANSFER OF FUNCTIONS

Reference to the Interstate Commerce Commission was changed to the Secretary of Transportation pursuant to Pub. L. 89-670, Oct. 15, 1966, 80 Stat. 931, which created the Department of Transportation and vested all powers, duties and functions of the Interstate Commerce Commission and of the Chairman, members, offices, and officers thereof relating generally to standard time zones and daylight savings time under this section in the Secretary of Transportation. See section 1655(e)(5) of Title 49, Transportation.

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 266, 267 of this title.

§ 260a. Advancement of time or changeover dates.

(a) Duration of period; State exemption.

During the period commencing at 2 o'clock antemeridian on the last Sunday of April of each year and ending at 2 o'clock antemeridian on the last Sunday of October of each year, the standard time of each zone established by sections 261 to 264 of this title, as modified by section 265 of this title, shall be advanced one hour and such time as so advanced shall for the purposes of such sections 261 to 264, as so modified, be the standard time of such zone during such period; except that any State may by law exempt itself from the provisions of this subsection providing for the advancement of time, but only if such law provides that the entire State (including all political subdivisions thereof) shall observe the standard time otherwise applicable under such sections 261 to 264, as so modified during such period.

(b) State laws superseded.

It is hereby declared that it is the express intent of Congress by this section to supersede any and all laws of the States or political subdivisions thereof insofar as they may now or hereafter provide for advances in time or changeover dates different from those specified in this section.

(c) Violations; enforcement.

For any violation of the provisions of this section the Secretary of Transportation or his duly authorized agent may apply to the district court of the United States for the district in which such violation occurs for the enforcement of this section; and such court shall have jurisdiction to enforce obedience thereto by writ of injunction or by other process, mandatory or otherwise, restraining against further violations of this section and enjoining obedience thereto. (Pub. L. 89-387, § 3, Apr. 13, 1966, 80 Stat. 107.)

TRANSFER OF FUNCTIONS

Reference to the Interstate Commerce Commission was changed to the Secretary of Transportation pursuant to Pub. L. 89-670, Oct. 15, 1966, 80 Stat. 931, which created the Department of Transportation and vested all powers, duties and functions of the Interstate Commerce Commission and of the Chairman, members, offices, and officers thereof relating generally to standard time zones and daylight savings time under this section in the Secretary of Transportation. See section 1655(e)(5) of Title 49, Transportation.

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in section 261 of this title.

§ 261. Zones for standard time; interstate or foreign commerce.

For the purpose of establishing the standard time of the United States, the territory of the United States shall be divided into eight zones in the manner provided in this section. Except as provided in section 260a(a) of this title, the standard time of the first zone shall be based on the mean solar time of the sixtieth degree of longitude west from Greenwich; that of the second zone on the seventy-fifth degree; that of the third zone on the ninetieth degree; that of the fourth zone on the one hundred and fifth degree; that of the fifth zone on the one hundred and twentieth degree; that of the sixth zone on the one hundred and thirty-fifth degree; that of

the seventh zone on the one hundred and fiftieth degree; and that of the eighth zone on the one hundred and sixty-fifth degree. The limits of each zone shall be defined by an order of the Secretary of Transportation, having regard for the convenience of commerce and the existing junction points and division points of common carriers engaged in interstate or foreign commerce, and any such order may be modified from time to time. As used in sections 261-264 of this title, the term "interstate or foreign commerce" means commerce between a State, the District of Columbia, the Commonwealth of Puerto Rico, or any possession of the United States and any place outside thereof. (Mar. 19, 1918, ch. 24, § 1, 40 Stat. 450; Apr. 13, 1966, Pub. L. 89-387, § 4(a), 80 Stat. 108.)

AMENDMENTS

1966—Pub. L. 89-387 increased the number of time zones from five for the territory of continental United States to eight for the territory of the United States, inserted the "exception phrase", substituted "solar" for "astronomical" time, established the first zone on basis of the 60th degree of longitude west from Greenwich, redesignated as the second through the fifth zones based on the 75th, 90th, 105th, and 120th degrees former zones one through four based on such degrees, established the sixth zone based on the 135th degree, redesignated as the seventh zone based on the 150th degree former fifth zone based on such degree, and established the eighth zone based on the 165th degree, substituted "interstate or foreign commerce" for "commerce between the several States and and with foreign nations" and defined "interstate or foreign commerce."

REPEALS

Section 5 of act Mar. 19, 1918, repealed all conflicting acts and parts of acts.

DISTRICT OF COLUMBIA

Act March 31, 1949, ch. 43, 63 Stat. 29, authorized the Board of Commissioners [now the District of Columbia Council] to establish daylight-saving time in the District of Columbia.

RETURN TO STANDARD TIME

Act Sept. 25, 1945, ch. 388, 59 Stat. 537, provided, that, notwithstanding the provisions of act Jan. 20, 1942, ch. 7, 56 Stat. 9, which provided for war time, the standard time for each zone as provided for in sections 261-264 of this title should again become effective as of Sept. 30, 1945, at 2:00 A. M.

TRANSFER OF FUNCTIONS

Reference to the Interstate Commerce Commission was changed to the Secretary of Transportation pursuant to Pub. L. 89-670, Oct. 15, 1966, 80 Stat. 931, which created the Department of Transportation and vested all powers, duties and functions of the Interstate Commerce Commission and of the Chairman, members, offices, and officers thereof relating generally to standard time zones and daylight savings time under this section in the Secretary of Transportation. See section 1655(a)(5) of Title 49, Transportation.

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 260, 260a, 262, 266, 267 of this title.

§ 262. Duty to observe standard time of zones.

Within the respective zones created under the authority of sections 261 to 264 of this title the standard time of the zone shall insofar as practicable (as determined by the Secretary of Transportation) govern the movement of all common carriers engaged in interstate or foreign commerce. In all statutes, orders, rules, and regulations relating to the time of performance of any act by any officer or department of the United States, whether in the

legislative, executive, or judicial branches of the Government, or relating to the time within which any rights shall accrue or determine, or within which any act shall or shall not be performed by any person subject to the jurisdiction of the United States, it shall be understood and intended that the time shall insofar as practicable (as determined by the Secretary of Transportation) be the United States standard time of the zone within which the act is to be performed. (Mar. 19, 1918, ch. 24, § 2, 40 Stat. 451; Apr. 13, 1966, Pub. L. 89-387, § 4(b), 80 Stat. 108.)

AMENDMENTS

1966—Pub. L. 89-387 inserted "insofar as practicable (as determined by the Interstate Commerce Commission)" in two instances and substituted "engaged in interstate or foreign commerce" for "engaged in commerce between the several States or between a State and any one of the Territories of the United States, or between a State or the Territory of Alaska and any one of the insular possessions of the United States or any foreign country".

TRANSFER OF FUNCTIONS

Reference to the Interstate Commerce Commission was changed to the Secretary of Transportation pursuant to Pub. L. 89-670, Oct. 15, 1966, 80 Stat. 931, which created the Department of Transportation and vested all powers, duties and functions of the Interstate Commerce Commission and of the Chairman, members, offices, and officers thereof relating generally to standard time zones and daylight savings time under this section in the Secretary of Transportation. See section 1655(e)(5) of Title 49, Transportation.

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 260, 260a, 261, 266, 267 of this title.

§ 263. Designation of zone standard times.

The standard time of the first zone shall be known and designated as Atlantic standard time; that of the second zone shall be known and designated as eastern standard time; that of the third zone shall be known and designated as central standard time; that of the fourth zone shall be known and designated as mountain standard time; that of the fifth zone shall be known and designated as Pacific standard time; that of the sixth zone shall be known and designated as Yukon standard time; that of the seventh zone shall be known and designated as Alaska-Hawaii standard time; and that of the eighth zone shall be known and designated as Bering standard time. (Mar. 19, 1918, ch. 24, § 4, 40 Stat. 451; Apr. 13, 1966, Pub. L. 89-387, § 4(c), 80 Stat. 108.)

AMENDMENTS

1966—Pub. L. 89-387 added Atlantic standard time as first zone designation; redesignated as eastern standard time, central standard time, mountain standard time and Pacific standard time for second through fifth zones former designation of United States standard eastern time, United States standard central time, United States standard mountain time and United States standard Pacific time for former zones one through four; added Yukon standard time as sixth zone designation; redesignated as Alaska-Hawaii standard time for seventh zone former designation of United States standard Alaska time for fifth zone; and added Bering standard time as eighth zone designation.

TRANSFER OF FUNCTIONS

All functions, powers, and duties of this Interstate Commerce Commission and the Chairman, members, offices, and officers thereof relating generally to standard

time zones and daylight savings time under this section were transferred to and vested in the Secretary of Transportation by Pub. L. 89-670, Oct. 15, 1966, 80 Stat. 931, which created the Department of Transportation. See section 1655(e)(5) of Title 49, Transportation.

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 260, 280a, 281, 262, 266, 267 of this title.

§ 264. Part of Idaho in third zone.

In the division of territory, and in the definition of the limits of each zone, as provided in sections 261 to 264 of this title, so much of the State of Idaho as lies south of the Salmon River, traversing the State from east to west near forty-five degree thirty minutes latitude, shall be embraced in the third zone: *Provided*, That common carriers within such portion of the State of Idaho may conduct their operations on Pacific time. (Mar. 19, 1918, ch. 24, § 3, as added Mar. 3, 1923, ch. 216, 42 Stat. 1434, and amended June 24, 1948, ch. 631, § 1, 62 Stat. 646.)

AMENDMENTS

1948—Act June 24, 1948, added proviso relating to common carriers.

EFFECTIVE DATE OF 1948 AMENDMENT

Section 2 of act June 24, 1948, provided that: "This Act [act June 24, 1948] shall take effect at 2 o'clock antemeridian of the second Monday following the date of its enactment [June 24, 1948]."

REPEALS

The original section 3 of act Mar. 19, 1916, providing for daylight-savings, was repealed by act Aug. 20, 1919, ch. 51, 41 Stat. 280.

TRANSFER OF FUNCTIONS

All functions, powers, and duties of the Interstate Commerce Commission and the Chairman, members, offices, and officers thereof relating generally to standard time zones and daylight savings time under this section were transferred to and vested in the Secretary of Transportation by Pub. L. 89-670, Oct. 15, 1966, 80 Stat. 931, which created the Department of Transportation. See section 1655(e)(5) of Title 49, Transportation.

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 260, 260a, 261, 262, 266 of this title.

§ 265. Transfer of certain territory to standard central-time zone.

The Panhandle and Plains sections of Texas and Oklahoma are transferred to and placed within the United States standard central-time zone.

The Secretary of Transportation is authorized and directed to issue an order placing the western boundary line of the United States standard central-time zone insofar as the same affect Texas and Oklahoma as follows:

Beginning at a point where such western boundary time zone line crosses the State boundary line between Kansas and Oklahoma; thence westerly along said State boundary line to the northwest corner of the State of Oklahoma; thence in a southerly direction along the west State boundary line of Oklahoma and the west State boundary line of Texas to the southeastern corner of the State of New Mexico; thence in a westerly direction along the State boundary line between the States of Texas and New Mexico to the Rio Grande River; thence down the Rio Grande River as the boundary line between the United States and Mexico: *Provided*,

That the Chicago, Rock Island and Gulf Railway Company and the Chicago, Rock Island and Pacific Railway Company may use Tucumcari, New Mexico, as the point at which they change from central to mountain time and vice versa; the Colorado Southern and Fort Worth and Denver City Railway Companies may use Sixela, New Mexico, as such changing point; the Atchison, Topeka and Santa Fe Railway Company and other branches of the Santa Fe system may use Clovis, New Mexico, as such changing point, and those railways running into or through El Paso may use El Paso as such point: *Provided further*, That this section shall not, except as herein provided, interfere with the adjustment of time zones as established by the Secretary of Transportation. (Mar. 4, 1921, ch. 173, § 1, 41 Stat. 1446.)

REPEALS

Section 2 of act Mar. 4, 1921, repealed all conflicting laws and parts of laws.

TRANSFER OF FUNCTIONS

Reference to the Interstate Commerce Commission was changed to the Secretary of Transportation pursuant to Pub. L. 89-670, Oct. 15, 1966, 80 Stat. 931, which created the Department of Transportation and vested all powers, duties and functions of the Interstate Commerce Commission and of the Chairman, members, offices, and officers thereof relating generally to standard time zones and daylight savings time under this section in the Secretary of Transportation. See section 1655(e) (5) of Title 49, Transportation.

TRANSFER OF EL PASO AND HUDSPETH COUNTIES, TEXAS, TO MOUNTAIN STANDARD TIME ZONE

Pub. L. 91-228, Apr. 10, 1970, 84 Stat. 119, provided: "That, notwithstanding the first section of the Act of March 4, 1921 (15 U.S.C. 265) [this section], the Secretary of Transportation may, upon the written request of the County Commissioners Court of El Paso County, Texas, change the boundary line between the central standard time zone and the mountain standard time zone, so as to place El Paso County in the mountain standard time zone, in the manner prescribed in section 1 of the Act of March 19, 1918, as amended (15 U.S.C. 261), and section 5 of the Act of April 13, 1966 (15 U.S.C. 266). In the same manner, the Secretary of Transportation may also place Hudspeth County, Texas, in the mountain standard time zone, if the Hudspeth County Commissioners Court so requests in writing and if El Paso County is to be placed in that time zone."

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 260, 260a, 266 of this title.

§ 266. Applicability of Administrative Procedure Act.

The Administrative Procedure Act shall apply to all proceedings under sections 260 to 267 of this title. (Pub. L. 89-387, § 5, Apr. 13, 1966, 80 Stat. 108.)

REFERENCES IN TEXT

The Administrative Procedure Act, referred to in text, is classified to sections 551 et seq. and 701 et seq. of Title 5, Government Organization and Employees.

CODIFICATION

"Sections 260 to 267 of this title" read in the original "this Act [meaning Pub. L. 89-387], the Act of March 19, 1918 (15 U.S.C. 261-264), and the Act of March 4, 1921 (15 U.S.C. 265)", which are classified to sections 260-263, 266, 267; 261-264; and 265 of this title, respectively.

TRANSFER OF FUNCTIONS

All functions, powers, and duties of the Interstate Commerce Commission and the Chairman, members, offices, and officers thereof relating generally to standards time zones and daylight savings time under this section

were transferred to and vested in the Secretary of Transportation by Pub. L. 89-670, Oct. 15, 1966, 80 Stat. 931, which created the Department of Transportation. See section 1655(e) (5) of Title 49, Transportation.

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in section 267 of this title.

§ 267. State defined.

As used in sections 260 to 263, 266 and 267 of this title, the term "State" includes the District of Columbia, the Commonwealth of Puerto Rico, or any possession of the United States. (Pub. L. 89-387, § 7, Apr. 13, 1966, 80 Stat. 109.)

TRANSFER OF FUNCTIONS

All functions, powers, and duties of the Interstate Commerce Commission and the Chairman, members, offices, and officers thereof relating generally to standard time zones and daylight savings time under this section were transferred to and vested in the Secretary of Transportation by Pub. L. 89-670, Oct. 15, 1966, 80 Stat. 931, which created the Department of Transportation. See section 1655(e) (5) of Title 49, Transportation.

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in section 266 of this title.

PART 71—STANDARD TIME ZONE BOUNDARIES

- Sec.
71.1 Limits defined; exceptions authorized for certain rail operating purposes only.
71.2 Annual advancement of standard time.
71.3 Atlantic zone.
71.4 Eastern zone.
71.5 Boundary line between eastern and central zones.
71.6 Central zone.
71.7 Boundary line between central and mountain zones.
71.8 Mountain zone.
71.9 Boundary line between mountain and Pacific zones.
71.10 Pacific zone.
71.11 Yukon zone.
71.12 Alaska-Hawaii zone.
71.13 Bering zone.

AUTHORITY: The provisions of this Part 71 issued under secs. 1-4, 40 Stat. 450, as amended, sec. 1, 41 Stat. 1446, as amended, secs. 2-7, 80 Stat. 107-109, sec. 6(e)(5), 80 Stat. 937, sec. 1, 84 Stat. 119; 15 U.S.C. 260-267, 49 U.S.C. 1655(e)(5), unless otherwise noted.

SOURCE: The provisions of this Part 71 appear at 35 F.R. 12318, Aug. 1, 1970, unless otherwise noted.

§ 71.1 Limits defined; exceptions authorized for certain rail operating purposes only.

(a) This part prescribes the geographic limits of each of the eight standard time zones established by section 1 of the Standard Time Act, as amended by section 4 of the Uniform Time Act of 1966 (15 U.S.C. 261). It also contains lists of operating exceptions granted for specified rail carriers, whose operations cross the time zone boundaries prescribed by this part, authorizing them to carry the standard of time on which the major portion of a particular operation is conducted into an adjoining time zone.

(b) Any rail carrier whose operations cross a time zone boundary prescribed by this part may apply for an operating exception to the General Counsel, Department of Transportation, Washington, D.C. 20590. However, each rail carrier for which an operating exception is granted shall, in its advertisements, time cards, station bulletin boards, and other publications, show arrival and departure times in terms of the standard time for the place concerned.

(c) The time zones established by the Standard Time Act, as amended by the

Uniform Time Act of 1966, are Atlantic, eastern, central, mountain, Pacific, Yukon, Alaska-Hawaii, and Bering.

§ 71.2 Annual advancement of standard time.

(a) Section 3(a) of the Uniform Time Act of 1966 (15 U.S.C. 260a(a)) requires that "the standard time of each zone * * * shall be advanced 1 hour [during the period beginning at 2:00 a.m. on the last Sunday in April of each year and ending at 2:00 a.m. on the last Sunday in October] * * * and such time as so advanced shall be the standard time of such zone during such period." The section further authorizes any State to exempt itself from this requirement. For these reasons, all times (including the period of advanced time) in the United States, whether in an exempted State or not, shall be cited as "standard time" during the entire year.

(b) Section 3(b) of the Uniform Time Act of 1966 (15 U.S.C. 260a(b)) provides that "it is the express intent of Congress * * * to supersede any and all laws of the States or political subdivisions thereof insofar as they may now or hereafter provide for advances in time or changeover dates different from those specified in [section 3(a) of that Act]", which are those specified in paragraph (a) of this section.

§ 71.3 Atlantic zone.

The first zone, the Atlantic standard time zone, includes that part of the United States that is between 52°30' W. longitude and 67°30' W. longitude and that part of the Commonwealth of Puerto Rico that is west of 67°30' W. longitude, but does not include any part of the State of Maine.

§ 71.4 Eastern zone.

The second zone, the eastern standard time zone, includes that part of the United States that is west of 67°30' W. longitude and east of the boundary line described in § 71.5, and includes all of the State of Maine, but does not include any part of the Commonwealth of Puerto Rico.

§ 71.5 Boundary line between eastern and central zones.

(a) *Minnesota - Michigan - Wisconsin.* From the junction of the western boundary of the State of Michigan with the boundary between the United States and Canada southerly and easterly along the

western boundary of the State of Michigan to a point in the middle of Lake Michigan opposite the main channel of Green Bay; thence southerly along the western boundary of the State of Michigan to its junction with the southern boundary thereof and the northern boundary of the State of Indiana.

(b) *Indiana-Illinois.* From the junction of the western boundary of the State of Michigan with the northern boundary of the State of Indiana easterly along the northern boundary of the State of Indiana to the east line of La Porte County; thence southerly along the east line of La Porte County to the north line of Starke County; thence east along the north line of Starke County to the east line of Starke County; thence south along the east line of Starke County to the south line of Starke County; thence west along the south line of Starke County to the east line of Jasper County; thence south along the east line of Jasper County to the south line of Jasper County; thence west along the south lines of Jasper and Newton Counties to the western boundary of the State of Indiana; thence south along the western boundary of Indiana to the north line of Gibson County; thence east along the north lines of Gibson and Pike Counties to the east line of Pike County; thence south along the east lines of Pike and Warrick Counties to the north line of Warrick County; thence east along the north lines of Warrick and Spencer Counties to the east line of Spencer County; thence south along the east line of Spencer County to the Indiana-Kentucky boundary.

(c) *Kentucky.* From the junction of the east line of Spencer County, Ind., with the Indiana-Kentucky boundary easterly along that boundary to the west line of Meade County, Ky.; thence southeasterly and southwesterly along the west lines of Meade and Hardin Counties to the southwest corner of Hardin County; thence along the south lines of Hardin and Larue Counties to the northwest corner of Taylor County; thence southeasterly along the west (southwest) line of Taylor County and northeasterly along the east (southeast) line of Taylor County to the west line of Casey County; and thence southerly along the west and south lines of Casey, Pulaski, and McCreary Counties to the Kentucky-Tennessee boundary.

(d) *Tennessee.* From the junction of the west line of McCreary County, Ky.,

with the Kentucky-Tennessee boundary westerly along that boundary to the west line of Scott County, Tenn.; thence southerly along the west line of Scott County, the north and west lines of Morgan County, and the north line of Roane County to the north line of Rhea County; thence northwesterly along the north line of Rhea County; and thence southwesterly along the west lines of Rhea and Hamilton Counties to the Tennessee-Georgia boundary.

(e) *Georgia-Alabama.* From the junction of the west line of Hamilton County, Tenn., with the Tennessee-Georgia boundary westerly along that boundary to its junction with the Alabama-Georgia boundary; thence southerly along that boundary and the Florida-Georgia boundary to the southwest corner of the State of Georgia.

(f) *Florida.* From the southwest corner of the State of Georgia to the midpoint of the Apalachicola River on the downstream side of Jim Woodruff Dam; thence southerly along the middle of the main channel of the Apalachicola River and Apalachicola Bay to the Gulf of Mexico.

(g) *Operating exceptions*—(1) *Lines east of boundary excepted from eastern zone.* Those parts of the following lines of railroad located east of the zone boundary described in this section, are, for operating purposes only, excepted from the eastern standard time zone and included within the central standard time zone:

Railroad	From—	To—
Baltimore & Ohio.	East line of La Porte County, Ind. (west of Walkerton, Ind.).	West yard limits of Garrett, Ind.
Do.....	Illinois-Indiana State line (west of Dana, Ind.).	West yard limits of Indianapolis, Ind.
Do.....	Illinois-Indiana State line (west of Vincennes, Ind.).	Washington, Ind.
Chicago, Milwaukee, St. Paul & Pacific.	Illinois-Indiana State line (northwest of Dana, Ind.).	Seymour, Ind.
Do.....	Michigan-Wisconsin State line (south of Iron Mountain, Mich.).	Champlion, Ontonagon, and Iron River, Mich. ¹
Chicago & Northwestern.	Michigan-Wisconsin State line.	East lines of Marquette and Delta Counties, Mich. ¹
Erie-Lackawanna.	South line of Starke County, Ind. (near Ora, Ind.).	Marion, Ohio.

See footnotes at end of table.

Railroad	From—	To—
Grand Trunk Western.	East line of La Porte County, Ind. (east of Mill Creek).	Michigan-Indiana State line (near Granger, Ind.).
Do.....	Michigan-Indiana State line (near Granger, Ind.).	Battle Creek, Mich. ¹
Illinois Central...	Illinois-Indiana State line (west of Riverton, Ind.).	South yard limits of Indianapolis, Ind.
Do.....	West line of Hardin County, Ky. (west of Summit, Ky.).	Hodgenville, Ky., and south yard limits of Louisville, Ky.
Louisville & Nashville.	West line of Meade County, Ky. (west of Guston, Ky.).	Strawberry, Ky.
Do.....	South line of Hardin County, Ky. (south of Dombey, Ky.).	Lebanon Junction, Ky.
Do.....	West line of Hamilton County, Tenn. (west of Hooker, Ga.).	Western limits of Chattanooga, Tenn.
Do.....	Apalachicola River.	River Junction, Fla.
Norfolk & Western.	East line of Starke County, Ind. (west of Burr Oak, Ind.).	East yard limits of Fort Wayne, Ind.
Do.....	East line of La Porte County, Ind. (east of Dillon, Ind.).	Toledo, Ohio.
Do.....	Illinois-Indiana State line (west of State line, Ind.).	Toledo, Ohio, and Ohio-Michigan State line (near Munson, Mich.).
Do.....	Ohio-Michigan State line (near Munson, Mich.).	Oakwood Junction, Mich. ¹
Do.....	East line of La Porte County, Ind. (west of Walkerton, Ind.).	South yard limits of Peru, Ind.
Do.....	Illinois-Indiana State line (west of Ambia, Ind.).	Frankfort, Ind.
Do.....	Illinois-Indiana State line (west of Cayuga, Ind.).	Frankfort, Ind.
Penn Central.....	Michigan-Indiana State line (south of Grand Beach, Mich.).	Niles, Mich. ¹
Do.....	East line of La Porte County, Ind. (west of Elkhart, Ind.).	Tower B (4.9 miles) east of the west line of Elkhart County, Ind.
Do.....	East line of Starke County, Ind. (west of Donaldson, Ind.).	Fort Wayne, Ind.
Do.....	South line of Starke County, Ind. (north of Denham, Ind.).	Logansport, Ind.
Do.....	East line of Jasper County, Ind. (east of Remington, Ind.).	Logansport, Ind.

Railroad	From—	To—	Railroad	From—	To—
Penn Central—Continued	The intersection of the north line of Benton County, Ind., and Illinois-Indiana State line (northwest of Sheff, Ind.).	Sheff, Ind.	Monon.....	North line of Pulaski County, Ind. (south of San Pierre).	Michigan City, Ind. and Hammond, Ind.
Do.....	South line of Newton County, Ind. (north of Sheff, Ind.).	Illinois-Indiana State line (northeast of Danville, Ill.).	Do.....	West line of White County, Ind. (west of Lee, Ind.).	Hammond, Ind. and Michigan City, Ind.
Do.....	Illinois-Indiana State line (west of St. Marys of the Woods, Ind.).	Ringo Tower, Ind. (Terre Haute).	Penn Central....	South line of Daviess County, Ind. (north of Petersburg, Ind.).	Ashby, Ind.
Do.....	Illinois-Indiana State line (east of Farrington, Ill.).	Ringo Tower, Ind. (Terre Haute).	Seaboard Coast Line.	Georgia-Alabama State line (west of Esom, Ga.).	Birmingham, Ala.
Peoria & Eastern.	Illinois-Indiana State line (east of Danville, Ill.).	West yard limits of Indianapolis, Ind.	Do.....	Georgia-Alabama State line (west of Omaha, Ga.).	Montgomery, Ala.
Soo Line.....	Michigan-Wisconsin State line.	United States-Canada Boundary (near Sault Ste. Marie, Mich.) ¹	Do.....	Georgia-Alabama State line (near Pyne, Ga.).	Parkwood, Ala.
Southern.....	East line of Pike County, Ind. (west of Stapleton, Ind.).	Junction with Baltimore & Ohio near Vincennes Street, New Albany, Ind.	Do.....	Georgia-Alabama State line (west of Saffold, Ga.).	Ahheville, Elba, and Montgomery, Ala.
			Tennessee, Alabama & Georgia.	Georgia-Alabama State line (southwest of Menlo, Ga.).	Gadsden, Ala.

¹ Effective only from 2 a.m. on the last Sunday in October to 2 a.m. on the last Sunday in April; exception unnecessary during the remainder of year because during that period Michigan time is not advanced and therefore is the same as central standard time (advanced).

(2) *Lines west of boundary included in eastern zone.* Those parts of the following lines of railroad located west of the zone boundary line described in this section, are, for operating purposes only, excepted from the central time zone and included within the eastern standard time zone:

Railroad	From—	To—
Apalachicola Northern.	Apalachicola, Fla., and Apalachicola River.	Port St. Joe, Fla.
Central of Georgia.	Georgia-Alabama State line (west of Hilton, Ga.).	Dothan, Ala.
Chesapeake & Ohio.	South line of Starke County, Ind. (north of Beardstown, Ind.).	Griffith, Ind.
Do.....	Michigan-Indiana State line (south of New Buffalo, Mich.).	Porter and La Crosse, Ind. ¹
Louisville & Nashville.	West line of Taylor County, Ky. (east of Whitewood, Ky.).	Greensburg, Ky.

See footnotes at end of table.

¹ Effective only from 2 a.m. on the last Sunday in October to 2 a.m. on the last Sunday in April; exception unnecessary during the remainder of the year because during that period Michigan time is not advanced and therefore is the same as central standard time (advanced).

(3) *Indiana and Ohio operations included in Michigan nonadvanced time.* Those parts of the following lines of railroad located east of the zone boundary described in this section, are, for operating purposes only, excepted from the eastern standard time zone to permit operations in accordance with Michigan nonadvanced eastern standard time during the period from 2 a.m. on the last Sunday in April to 2 a.m. on the last Sunday in October:

Railroad	From—	To—
Chesapeake & Ohio.	Michigan-Ohio State line (north of Alexis, Ohio).	Alexis, Ohio.
Detroit & Toledo Shore Line.	Michigan-Ohio State line (north of Toledo, Ohio).	Toledo, Ohio.
Penn Central.....	Michigan-Indiana State line (north of Vistula, Ind.).	Tower B, Elkhart, Ind.
Do.....	Michigan-Ohio State line (north of Alexis, Ohio).	Alexis, Ohio.
Do.....	Michigan-Indiana State line (south of Niles, Mich.).	South Bend, Ind.
Do.....	Michigan-Indiana State line (south of Sturgis, Mich.).	Fort Wayne, Ind.

(4) *Michigan operations excepted from Michigan nonadvanced eastern*

standard time. Those parts of the following lines of railroad located within the State of Michigan and east of the zone boundary described in this section, are, for operating purposes only, excepted from the requirement to operate in accordance with Michigan's nonadvanced eastern standard time and are authorized to operate on eastern standard time (advanced) during the period from 2 a.m. on the last Sunday in April to 2 a.m. on the last Sunday in October.

Railroad	From—	To—
Ann Arbor.....	Ohio-Michigan State line (north of Alexis, Ohio).	Owosso, Mich.
Detroit, Toledo & Ironton.	Ohio-Michigan State line (north of Metamora, Ohio).	Detroit and Dearborn, Mich.
Do.....	Ohio-Michigan State line (north of Denison, Ohio).	Tecumseh, Mich.
Do.....	Ohio-Michigan State line (north of Alexis, Ohio) cover the tracks of the Ann Arbor Railroad).	Diann, Mich.
Penn Central.....	Indiana-Michigan State line (north of Ray, Ind.).	Jackson, Mich.
Do.....	White Pigeon Junction, Mich.	Jonesville, Mich.
Do.....	Litchfield, Mich.	Osseo, Mich.
Do.....	Bankers, Mich.	North Adams, Mich.
Do.....	Morenci, Mich.	Palmyra, Mich.
Do.....	Clayton, Mich.	Ida, Mich.
Do.....	Ohio-Michigan State line (south of Ottawa Lake, Mich.).	Clinton, Mich.
Do.....	Ohio-Michigan State line (north of Alvordton, Ohio).	Jackson, Mich.
Do.....	Cement City, Mich.	Brooklyn, Mich.

(h) *Municipalities on boundary line.* All municipalities located upon the zone boundary line described in this section are in the central standard time zone, except Apalachicola, Fla., which is in the eastern standard time zone.

§ 71.6 Central zone.

The third zone, the central standard time zone, includes that part of the United States that is west of the boundary line between the eastern and central standard time zones described in § 71.5 and east of the boundary line between the central and mountain standard time zones described in § 71.7.

§ 71.7 Boundary line between central and mountain zones.

(a) *Montana-North Dakota.* Beginning at the junction of the Montana-North Dakota boundary with the boundary of the United States and Canada southerly along the Montana-North Dakota boundary to the Missouri River; thence southerly and easterly along the middle of that river to the midpoint of the confluence of the Missouri and Yellowstone Rivers; thence southerly and easterly along the middle of the Yellowstone River to the north boundary of T. 150 N., R. 104 W.; thence east to the northwest corner of T. 150 N., R. 102 W.; thence south to the southwest corner of T. 149 N., R. 102 W.; thence east to the northwest corner of T. 148 N., R. 102 W.; thence south to the northwest corner of T. 147 N., R. 102 W.; thence east to the southwest corner of T. 148 N., R. 101 W.; thence south to the middle of the Little Missouri; thence easterly and northerly along the middle of that river to the midpoint of its confluence with the Missouri River; thence southerly and easterly along the middle of the Missouri River to the north line of Morton County; thence west along the north line of Morton County to the northwest corner of T. 140 N., R. 83 W.; thence south to the southwest corner of T. 140 N., R. 83 W.; thence east to the southeast corner of T. 140 N., R. 83 W.; thence south to the middle of the Heart River; thence easterly and northerly along the middle of that river to the southern boundary of T. 139 N., R. 82 W.; thence east to the middle of the Heart River; thence southerly and easterly along the middle of that river to the midpoint of the confluence of the Heart and Missouri Rivers; thence southerly and easterly along the middle of the Missouri River to the northern boundary of T. 130 N., R. 80 W.; thence west to the northwest corner of T. 130 N., R. 80 W.; thence south to the North Dakota-South Dakota boundary; thence easterly along that boundary to the middle of the Missouri River.

(b) *South Dakota.* From the junction of the North Dakota-South Dakota boundary with the Missouri River southerly along the main channel of that river to the crossing of the Chicago & North Western Railway near Pierre; thence southwesterly to the northeast corner of T. 1 S., R. 28 E. in Jones County; thence south along the range line between Rs.

28 and 29 E. to the north line of Mellette County; thence east along the north line of Mellette County to the west line of Tripp County; thence south along the west line of Tripp County to the North Dakota-Nebraska boundary.

(c) *Nebraska*. From the junction of the west line of Tripp County, South Dakota with the South Dakota-Nebraska boundary west along that boundary to the west line of R. 30 W.; thence south along the range line between Rs. 30 and 31 W. to the southwest corner of sec. 19, T. 33 N., R. 30 W.; thence easterly along section lines to the northeast corner of sec. 29, T. 33 N., R. 30 W.; thence southerly along section lines with their offsets to the northeast corner of sec. 17, T. 32 N., R. 30 W.; thence westerly along section lines to the northwest corner of sec. 18, T. 32 N., R. 30 W.; thence southerly along the range line to the southwest corner of T. 31 N., R. 30 W.; thence easterly along the township line to the northeast corner of T. 30 N., R. 30 W.; thence southerly along the range line to the southwest corner of T. 29 N., R. 29 W.; thence westerly along the township line to the northwest corner of sec. 4, T. 28 N., R. 30 W.; thence southerly along section lines to the southwest corner of sec. 33, T. 28 N., R. 30 W.; thence easterly along the township line to the northeast corner of sec. 4, T. 27 N., R. 30 W.; thence southerly along section lines to the southwest corner of sec. 22, T. 26 N., R. 30 W.; thence easterly along section lines to the southeast corner of sec. 24, T. 26 N., R. 30 W.; thence southerly along the range line to the north line of Thomas County; thence westerly along the north line of Thomas County to the west line of Thomas County; thence south along the west line of Thomas County to the north line of McPherson County; thence west along the north line of McPherson County to the west line of McPherson County; thence south along the west line of McPherson County to the north line of Keith County; thence east along the north line of Keith County to the west line of Lincoln County; thence south along the west line of Lincoln County to the north line of Hayes County; thence west along the north line of Hayes County to the west line of Hayes County; thence south along the west line of Hayes and Hitchcock Counties to the Nebraska-Kansas boundary.

(d) *Kansas-Colorado*. From the junction of the west line of Hitchcock County, Nebr., with the Nebraska-Kansas boundary westerly along that boundary to the northwest corner of the State of Kansas; thence southerly along the Kansas-Colorado boundary to the north line of Sherman County, Kans.; thence easterly along the north line of Sherman County to the east line of Sherman County; thence southerly along the east line of Sherman County to the north line of Logan County; thence westerly along the north line of Logan County to the east line of Wallace County; thence southerly along the east line of Wallace County to the north line of Wichita County; thence westerly along the north line of Wichita County to the east line of Greeley County; thence southerly along the east line of Greeley County to the north line of Hamilton County; thence easterly along the north line of Hamilton and Kearny Counties to the junction of the east line of R. 36 W.; thence southerly along the range line between Rs. 35 and 36 W. with its offset to the south line of Kearny County; thence westerly along the south line of Kearny and Hamilton Counties to the Kansas-Colorado boundary; thence southerly along the Kansas-Colorado boundary to the junction of that boundary with the north boundary of the State of Oklahoma.

(e) *Oklahoma-Texas-New Mexico*. From the junction of the Kansas-Colorado boundary with the northern boundary of the State of Oklahoma westerly along the Colorado-Oklahoma boundary to the northwest corner of the State of Oklahoma; thence southerly along the west boundary of the State of Oklahoma and the west boundary of the State of Texas to the southeast corner of the State of New Mexico; thence westerly along the Texas-New Mexico boundary to the east line of Hudspeth County, Tex.; thence southerly along the east line of Hudspeth County, Tex., to the boundary between the United States and Mexico.

(f) *Operating exceptions*—(1) *Lines east of boundary excepted from central zone*. Those parts of the following lines of railroad, located east of the zone boundary line described in this section, are, for operating purposes only, excepted from the central standard time zone and are included within the mountain standard time zone:

Railroad	From—	To—
Atchison, Topeka, & Santa Fe.	East line of T. 24 S., R. 36 W., Kearny County, Kans.	Scott City and Dodge City, Kans.
Do.....	Kansas-Colorado State line.	Satanta, Kans.
Do.....	Colorado-Oklahoma State line.	Dodge City, Kans., via Bolse City, Okla.
Chicago, Burlington, & Quincy.	East line of Hooker County, Nebr.	Ravenna, Nebr.
Do.....	East line of Perkins County, Nebr.	Holdrege, Nebr.
Do.....	East line of Chase County, Nebr.	McCook, Nebr.
Do.....	East line of Dundy County, Nebr.	Do.
Chicago, Milwaukee, St. Paul & Pacific.	Missouri River, S. Dak.	Mobridge, S. Dak.
Chicago & Northwestern.	West line of T. 34 N., R. 30 W., ChERRY County, Nebr.	Long Pine, Nebr.
Great Northern..	Montana-North Dakota State line.	Williston, N. Dak.
Do.....	Yellowstone River, N. Dak.	Waterford City, N. Dak.
Northern Pacific.	East line of T. 133 N., R. 83 W., Morton County, N. Dak.	Mandan, N. Dak.
Do.....	North line of T. 140 N., R. 81 W., Morton County, N. Dak.	Do.
Do.....	South line of T. 139 N., R. 81 W., Morton County, N. Dak.	Do.
Union Pacific....	East line of Keith County, Nebr.	North Platte, Nebr.
Do.....	East line of Wallace County, Kans.	Ellis, Kans.

(2) *Lines west of boundary included in central zone.* Those parts of the following lines of railroad located west of the zone boundary line described in this section are, for operating purposes only, excepted from the mountain standard time zone and are included within the central standard time zone:

Railroad	From—	To—
Atchison, Topeka, & Santa Fe.	Texas-New Mexico State line (near Texico, N. Mex.).	Clovis, N. Mex.
Chicago, Rock Island & Pacific.	Texas-New Mexico State line.	Tucumcari, N. Mex.
Do.....	West line of Thomas County, Kans.	Goodland, Kans.

Railroad	From—	To—
Missouri.....	West line of Wichita County, Kans.	Pueblo, Colo.
Soo Line.....	Montana-North Dakota State line.	Whitetail, Mont.
Southern Pacific.	East line of Hudspeth County, Tex.	El Paso, Tex.
Texas & Pacific.do.....	Do.
Texas-New Mexico.	Texas-New Mexico State line.	Lovington, N. Mex.

(g) *Points on boundary line.* All municipalities located upon the zone boundary line described in this section are in the mountain standard time zone, except Murdo, S. Dak., which is in the central standard time zone.

§ 71.8 Mountain zone.

The fourth zone, the mountain standard time zone, includes that part of the United States that is west of the boundary line between the central and mountain standard time zones described in § 71.7 and east of the boundary line between the mountain and Pacific standard time zones described in § 71.9.

§ 71.9 Boundary line between mountain and Pacific zones.

(a) *Montana-Idaho-Oregon.* From the junction of the Idaho-Montana boundary with the boundary between the United States and Canada southerly along the Idaho-Montana boundary to the boundary line between Idaho County, Idaho, and Lemhi County, Idaho; thence southwesterly along the boundary line between those two counties to the main channel of the Salmon River; thence westerly along the main channel of the Salmon River to the Idaho-Oregon boundary; thence southerly along that boundary to the boundary line between Baker County, Oreg., and Malheur County, Oreg.; thence westerly along the north line of Malheur County to the northwest corner of Malheur County; thence southerly along the west line of Malheur County to the southwest corner of T. 35 S., R. 37 E.; thence east to the Idaho-Oregon boundary; thence south along that boundary to the southwest corner of the State of Idaho; thence easterly along the Idaho-Nevada boundary to the northeast corner of the State of Nevada.

(b) *Utah-Nevada-Arizona-California.* From the northeast corner of the State

of Nevada southerly along the Utah-Nevada boundary, the Nevada-Arizona boundary, and the Arizona-California boundary to the boundary between the United States and Mexico.

(c) *Operating exceptions*—(1) *Lines east of boundary excepted from mountain zone.* Those parts of the following lines of railroad located east of the zone boundary line described in this section, are, for operating purposes only, excepted from the mountain standard time zone and are included within the Pacific standard time zone:

Railroad	From—	To—
Great Northern...	Troy, Mont.....	Montana-Idaho State line.
Northern Pacific.	Paradise, Mont....	Do.
Southern Pacific..	Ogden, Utah.....	Utah-Nevada State line.
Western Pacific...	Salt Lake City, Utah.	Do.
Do.....	Burmester, Utah..	Warner, Utah.

(2) *Lines west of boundary included in mountain zone.* Those parts of the following lines of railroad located west of the zone boundary line described in this section, are, for operating purposes only, excepted from the Pacific standard time zone and are included in the mountain standard time zone:

Railroad	From—	To—
Atchison, Topeka, & Santa Fe.	Colorado River...	Southern limits of Needles, Calif.
Chicago, Milwaukee, St. Paul & Pacific.	Montana-Idaho State line.	Avery, Idaho.
Union Pacific....	Idaho-Nevada State line near Idavada, Idaho.	Wells, Nevada.
Do.....	West line of Malheur County, Oreg.	Burns, Oreg.

(d) *Points on boundary line.* All municipalities located upon the zone boundary line described in this section are in the mountain standard time zone.

§ 71.10 Pacific zone.

The fifth zone, the Pacific standard time zone, includes that part of the United States that is west of the boundary line between the mountain and Pacific standard time zones described in § 71.9 and east of 137° W. longitude.

§ 71.11 Yukon zone.

The sixth zone, the Yukon standard time zone, includes that part of the United States that is between 137° W. longitude and 141° W. longitude.

§ 71.12 Alaska-Hawaii zone.

The seventh zone, the Alaska-Hawaii standard time zone, includes that part of the United States that is between 141° W. longitude and 162° W. longitude and including all of the State of Hawaii.

§ 71.13 Bering zone.

The eighth zone, the Bering standard time zone, includes that part of the United States that is between 162° W. longitude and 172°30' W. longitude and that part of the Aleutian Islands that is west of 172°30' W. longitude, but does not include any part of the State of Hawaii.

bridges at Park and High Streets and Department of the Army highway and railroad bridges at Fruitvale Avenue.—From 7 a.m. to 8:30 a.m. and 3:30 p.m. to 5:30 p.m., Monday through Friday, except national holidays, the draw shall open on signal if at least 2 hours notice is given. At all other times the draw shall open promptly on signal. In case of emergency the draws shall open on signal at any time.

(Sec. 5, 28 Stat. 362, as amended, sec. 6(g) (2), 80 Stat. 637; 33 U.S.C. 499, 49 U.S.C. 1655(g) (2); 49 CFR 1.46(c) (5), 33 CFR 1.05-1(c) (4).)

Effective date.—This revision shall become effective on May 16, 1973.

Dated April 6, 1973.

J. D. MCGANN,
Captain, U.S. Coast Guard, Acting
Chief, Office of Marine
Environment and Systems.

[FR Doc. 73-7053 Filed 4-11-73; 8:45 am]

CHAPTER IV—ST. LAWRENCE SEAWAY DEVELOPMENT CORPORATION PART 401—SEAWAY REGULATIONS AND RULES

Correction

In FR Doc. 73-6123 appearing at page 8433 in the issue of Monday, April 2, 1973, the following changes should be made:

1. In the table under § 401.103-5, in the second column directly above the first entry, insert **UPBOUND VESSELS**.
2. In the second column on page 8442, the section designated as § 401.105-2 *Signals—explosive vessel*., should be “§ 401.105-8 *Signals—explosive vessel*.”
3. In § 401.120-1, in the second column, under part 1, in paragraph 1.(d), change the word “of” to read “or”.

Title 47—Telecommunication CHAPTER I—FEDERAL COMMUNICATIONS COMMISSION

[Docket No. 19547; FCC 73-169]

PART 2—FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

Space Telecommunication

Correction

In FR Doc. 73-3567 appearing at page 5562 of the issue for Thursday, March 1, 1973, the following should be added on page 5608, column 3, immediately following the description of Owens Valley Observatory:

and 118° 30' W. and the second between latitudes 37° N. and 38° N. and longitudes 118° W. and 118° 50' W.

Pennsylvania State University Radio Astronomy Observatory. Rectangle between latitudes 40° 00' N. and longitudes 77° 15' W. and 78° 40' W.

Title 49—Transportation Subtitle A—Office of the Secretary of Transportation

[Docket No. 21; Amdt. 71-13]

PART 71—STANDARD TIME ZONE BOUNDARIES

Relocation of Eastern-Central Standard Time Zone Boundary in the State of Michigan

The purpose of this amendment to part 71 of title 49 of the Code of Federal Regulations is to change the existing boundary line between the eastern time zone and the central time zone as it relates to the State of Michigan.

On March 15, 1973, the Department of Transportation published in the **FEDERAL REGISTER** (38 FR 7009), a notice of proposed rulemaking to relocate a segment of the boundary between the eastern and central time zones from its present location along the border between the State of Wisconsin and the Upper Peninsula of the State of Michigan northward in order to include four Upper Peninsula counties along the Wisconsin border (Menominee, Dickinson, Iron, and Gogebic) in the central time zone.

The proposal was based on a petition from the Board of County Commissioners of each of the four counties. The petitions cited two reasons for seeking the change—closer commercial relations with neighboring communities in the State of Wisconsin, which is in the central zone, than with the rest of the State of Michigan; and the recent decision of the State of Michigan to observe advanced (daylight, or “fast”) time beginning in 1973. From 1969 to 1972, the State of Michigan exercised its option under section 3(a) of the Uniform Time Act of 1966 (15 U.S.C. § 260a) and exempted itself from the observance of advanced time. Thus, eastern standard (slow) time was observed throughout the year in Michigan. All or part of the four counties concerned are further west than Chicago, Ill., which is in the central zone; the westernmost of the counties, Gogebic, is as far west as St. Louis, Mo., which is also in the central zone. (In fact, the westernmost part of Gogebic County is farther west than the 19th meridian west of Greenwich, which is the standard meridian of the central zone.) Under eastern advanced time, during the summer, areas that far west have daylight on some days as late as 10:30 p.m.; under central advanced time (which is the same time on the clock as eastern standard time) there is daylight on those days only as late as 9:30 p.m.

Under the Uniform Time Act of 1966, the Secretary of Transportation is authorized to modify the boundaries of time zones “having regard for the convenience of commerce and the existing junction points and division points of common carriers engaged in interstate or foreign commerce.”

Interested persons were given a 22-day period within which to comment in writing on the proposed change. In addition, a representative of the Department conducted a public hearing on the proposal in each of the four counties, during which interested persons had opportunity to comment on the proposal either orally or in writing, or both. Although percentages varied county by county, comments received from each county overwhelmingly favor the proposal. Of the total of approximately 1,500 persons who submitted comments, approximately 90 percent favor the proposal, and document commercial relations with both the State of Wisconsin and other areas in the central time zone close enough to demonstrate that the convenience of commerce would be served by including the four counties in the central time zone. Among those favoring the proposal is North Central Airlines, Inc., the only certificated air carrier engaged in interstate commerce in the four-county area.

The Department also invited comments on whether any counties in the Upper Peninsula contiguous to the four named should be placed in the central zone. Since very few persons addressed themselves to this, only the four counties named are being placed in the central zone at this time. Many persons, however, urged the Department to locate the boundary line farther east in the Upper Peninsula, between the counties of Alger and Schoolcraft in the west and the counties of Luce and Mackinac in the east. These counties meet in a straight north-south line approximately 86° west of Greenwich. These persons contend that—

(1) There are two discernible economic areas in the Upper Peninsula;

(2) The 12 Upper Peninsula counties west of this north-south line (Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Marquette, Menominee, Ontonagon, and Schoolcraft) form an area closely tied economically to the State of Wisconsin;

(3) The three Upper Peninsula counties east of this line (Chippewa, Luce, and Mackinac) form another, closely tied economically to the Lower Peninsula of Michigan;

(4) This north-south line runs through a sparsely populated section of the Upper Peninsula and relocating the time zone boundary along it would inconvenience relatively few people.

Although the Department recognizes the validity of these contentions, relocation of the boundary that far east was not within the scope of the proposal which led to this rulemaking. These contentions will, however, be considered as the Department evaluates the effect of the relocation which is being made.

Advanced time begins this year at 2 a.m., Sunday, April 29. Making the relocation of the boundary effective at that time will serve both the convenience of

commerce and the convenience of the persons living in the area affected by the change (since eastern standard time is the same time on the clock as central advanced time, they will not have to change their clocks). I therefore find that good cause exists for making this amendment effective in fewer than 30 days after publication in the FEDERAL REGISTER.

In consideration of the foregoing, effect at 2 a.m. on April 29, 1973, paragraph (a) of § 71.5 of title 49 of the Code of Federal Regulations is amended to read as follows:

§ 71.5 Boundary line between eastern and central zones.

(a) *Minnesota-Michigan-Wisconsin.*—From the junction of the western boundary of the State of Michigan with the boundary between the United States and Canada northerly and easterly along the west line of Gogebic County to the west line of Ontonagon County; thence south along the west line of Ontonagon County to the north line of Gogebic County; thence southerly and easterly along the north line of Gogebic County to the west line of Iron County; thence north along the west line of Iron County to the north line of Iron County; thence east along the north line of Iron County to the east line of Iron County; thence south along the east line of Iron County to the north line of Dickinson County; thence east along the north line of Dickinson County to the east line of Dickinson County; thence south along the east line of Dickinson County to the north line of Menominee County; thence east along the north line of Menominee County to the east line of Menominee County; thence southerly and easterly along the east line of Menominee County to Lake Michigan; thence east to the western boundary of the State of Michigan; thence southerly and easterly along the western boundary of the State of Michigan to a point in the middle of Lake Michigan opposite the main channel of Green Bay; thence southerly along the western boundary of the State of Michigan to its junction with the southern boundary thereof and the northern boundary of the State of Indiana.

This amendment does not concern adherence to or exemption from advanced time. The Uniform Time Act of 1966 requires observance of advanced time from 2 a.m. on the last Sunday in April to 2 a.m. on the last Sunday in October of each year, but permits any State to exempt itself from this requirement by law applicable to the entire State. A State that has parts in more than one time zone may exempt the entire area within one time zone without exempting the entire State. Thus, that part of the State of Michigan which is hereby placed in the central time zone must, under existing law in the State of Michigan, observe central advanced time from 2 a.m. on the last Sunday in April to 2 a.m. on the last Sunday in October of each year. That entire part may, however, be exempted from such observance by act of the Michigan legislature. The Department of

Transportation does not have any administrative authority with respect to this requirement.

(Act of March 19, 1918, as amended by the Uniform Time Act of 1966, 15 U.S.C. 260-267; sec. 6(e) (5), Department of Transportation Act, 49 U.S.C. 1655(e) (5).)

Issued in Washington, D.C., on April 10, 1973.

CLAUDE S. BRINEGAR,
Secretary of Transportation.

[FR Doc.73-7199 Filed 4-11-73; 6:45 am]

Title 49—Transportation
SUBTITLE A—OFFICE OF THE SECRETARY
OF TRANSPORTATION

[OST Docket No. 34]

PART 73—EMERGENCY DAYLIGHT
SAVING TIME

Procedures and Criteria for Implementation

The Emergency Daylight Saving Time Energy Conservation Act of 1973 (December 15, 1973, Pub. L. 93-182) ("the Act") advances the standard time by one hour in all eight standard time zones of the United States continuously from 2:00 a.m. Sunday, January 6, 1974, to 2:00 a.m. Sunday, April 27, 1975, and provides that the time as so advanced shall be standard time. The purpose of the regulations which appear below is to set forth procedures and criteria for implementation of the Act.

Two classes of States are permitted to exempt themselves from advanced time: (1) Any State which is entirely within one time zone and not contiguous to any other State (Hawaii, Puerto Rico, and the Virgin Islands); and (2) any State with parts thereof in more than one time zone (Alaska, Florida, Idaho, Indiana, Kansas, Kentucky, Michigan, Nebraska, North Dakota, Oregon, South Dakota, Tennessee, and Texas). (Section 3(a)). If a State elects to exempt itself, the exemption must apply to the entire area of the State lying within one time zone, and the effect of the exemption must be to put the entire State on uniform time (i.e. the exemption can only apply to that part of the State in the more easterly zone) (see H. Rep. No. 93-709 at 5). While this limitation could not be literally applied to Alaska, which is in four time zones, any exemption for that State would have to take account of this intent of Congress.

Section 3(c) of the Act provides that any law in effect on October 27, 1973, exempting a State from advanced time under section 3(a) of the Uniform Time Act of 1966 (15 U.S.C. § 260a(a)) shall remain in effect as the exercise by the State of the exemption permitted by section 3(a) of the Act unless the State by law provides that such exemption shall not apply during the effective period of the Act. Thus, the effect of section 3(c) of the Act is to continue exemptions enacted by Indiana, Hawaii, Puerto Rico and the Virgin Islands, unless the legislature passes a law providing that the exemption shall not apply. (The State of Arizona has also enacted an exemption pursuant to section 3(a) of the Uniform Time Act which was in effect October 27, 1973; however, that exemption does not remain in effect and Arizona may not otherwise exempt itself because, although it lies entirely within one time zone, it is contiguous to another State and therefore does not satisfy the statutory requirements for exemption.)

States permitted exemptions by section 3(a) may exempt themselves from advanced time anytime during the period

the Act is in effect. The exemption must, however, be complete; a State may not elect to exempt itself from advanced time during winter months but observe advanced time during summer months.

Section 3(b) of the Act permits the President to grant a State an exemption from the advanced time established by section 3(a) of the Act or a request for realignment of the existing limits of time zones, if the State, by proclamation of its Governor, makes a finding prior to Sunday, January 6, 1974—the effective date of the Act—that such exemption or realignment is necessary to avoid undue hardship or to conserve fuel in such State or part thereof. ("[The President's] decision should be based on the appropriateness of all aspects of any exemption, including convenience of commerce, possible energy savings, or undue hardship to large segments of the population, as well as the possible impact on the success of and cooperation with the national energy conservation program." S. Rep. No. 93-504 at 3.)

By Executive Order 11751, Issued December 15, 1973, the President has designated and empowered the Secretary of Transportation to exercise the authority vested in him by section 3(b) to grant the exemptions or realignments.

The last regular Federal workday before the effective date of the Act is Friday, January 4, 1974. Therefore, proclamations should be received by the Department of Transportation not later than 5:30 p.m. eastern standard time on that date.

Section 2 of the Executive Order establishes the following criteria to guide the Secretary in the exercise of the authority delegated by the Order:

1. The policy of the United States, as expressed in section 2 of the Uniform Time Act of 1966 (15 U.S.C. 260), to promote the adoption and observance of uniform time within the standard time zones of the United States. This means that an exemption will not ordinarily be granted to an area if the effect would be to put it on a time different from all contiguous areas.

2. The convenience of commerce. This is the primary standard in section 4 of the Uniform Time Act of 1966 (15 U.S.C. 261) guiding the Secretary's decisions whether to modify time zone limits under that section. This means that the problems of carriers engaged in interstate and foreign commerce and of the broadcast media will be given considerable weight in determining whether an exemption or realignment will be granted.

3. Possible energy savings. The rationale behind the Act is that year-round advanced time will conserve energy. Since any exemption or realignment may interfere with the testing of this rationale, a Governor claiming that an exemption or realignment will conserve fuel must produce evidence substantiating the effect on fuel use in the subject area and in related power-consumption areas.

4. Undue hardship to large segments of the population. Included within this criterion are considerations of the com-

merce and industry in the area covered by the proclamation, weather conditions, problems of school children that cannot be dealt with adequately by State and local authorities, motor vehicle traffic patterns and densities, commercial and energy relationships with surrounding areas, and location on the western edges of a time zone which has a severe westward extension. For a showing of "undue" hardship, the effects must substantially exceed those consequences presumably recognized by the Congress as necessarily incident to advanced time during winter months.

5. Possible impact on the success of and cooperation with the national energy conservation program. Many of the measures being taken or planned as part of the national energy conservation program are directed, among other things, to the reduction and shift of peak energy demands, increased use of mass transportation and car pools, increased load factors in commercial aviation, and conversion of heating and power plants to alternative fuels. Any exemption or realignment inconsistent with, or counterproductive to the success of, any of these measures will be denied unless specific evidence is presented that an overriding reason exists for granting the exemption or realignment.

In deciding whether to grant an exemption or realignment the Secretary may, by virtue of section 3 of the Executive Order, seek information and advice from any appropriate Federal agency.

Any exemption enacted pursuant to section 3(a) and any exemption or realignment granted pursuant to section 3(b) expires contemporaneously with the expiration of the Act at 2:00 a.m. Sunday, April 27, 1975, at which time only those exemptions enacted pursuant to section 3(a) of the Uniform Time Act of 1966, as amended, and time zone limits as they existed on October 27, 1973, will be effective.

In addition to the foregoing, the Act contains other significant provisions:

1. Section 5 suspends for the duration of the Act the authority of the Secretary under section 4 of the Uniform Time Act of 1966 (15 U.S.C. 261) to modify the limits of time zones. During the effective period of the Act, time zone limits may be realigned only in accordance with section 3(b) of the Act and only for the duration of the Act.

2. Section 3(d) makes applicable to the Act the preemption provision in section 3(b) of the Uniform Time Act of 1966 (15 U.S.C. 260a(b)), superseding all laws of States and their political subdivisions insofar as they are inconsistent with the six months of advanced time established by section 3(a) of the Uniform Time Act. Thus, during the effective period of the Act, all laws of States and their political subdivisions are superseded to the extent they are inconsistent with the Act.

3. The authority of the Secretary under section 3(c) of the Uniform Time Act of 1966 (15 U.S.C. 260a(c)) to seek enforcement in the appropriate United States District Courts of the advanced

time provision of the Uniform Time Act of 1966, as amended, is made applicable to the Act by section 3(d) of the Act.

4. The Secretary, with the cooperation of all appropriate Federal agencies, is required to study the full range of effects of the year-round advanced time established by the Act and to submit two reports to Congress thereon. In order to limit the number of variables affecting the operation of the Act and improve the reliability of the study, an exemption or realignment granted by the Secretary may not be revoked or modified during the effective period of the Act except with the prior written approval of the Secretary.

Because of the emergency nature of the Act and the short period of time between its enactment, December 15, 1973, and its taking effect, January 6, 1974, I find that notice and public procedure on these regulations is contrary to the public interest and that good cause exists for making them effective in fewer than 30 days after publication in the FEDERAL REGISTER.

In consideration of the foregoing, Title 49 of the Code of Federal Regulations is amended by adding thereto a new Part 73, to read as follows:

Subpart A—General

Sec.	Purpose.
73.1	Definitions.
73.5	State exemption for State in two time zones.
73.7	Grant of exemption or realignment by the Secretary.
73.9	Reduction in number of time zones.
73.11	Restrictions on exemptions and realignments.
73.13	Expiration of exemptions and realignments.

Subpart B—Procedures and Criteria

73.21	Submission of proclamation of a Governor.
73.23	Decision of the Secretary.
73.25	Criteria.

AUTHORITY: Pub. L. 93-182, December 15, 1973; Executive Order 11751, December 15, 1973; 5 U.S.C. 552(a) (1).

Subpart A—General

§ 73.1 Purpose.

This part sets forth the procedures and criteria for implementation of the Emergency Daylight Saving Time Energy Conservation Act of 1973 (December 15, 1973, Pub. L. 93-182) ("the Act").

§ 73.3 Definitions.

As used in this part—
"Governor of a State" and "Governor" include the Commissioner of the District of Columbia, the Governor of the Commonwealth of Puerto Rico, and the Governor of the Virgin Islands.
"Secretary" means the Secretary of Transportation.

"State" includes the District of Columbia, the Commonwealth of Puerto Rico, and any possession of the United States.

§ 73.5 State exemption for State in two time zones.

An exemption enacted pursuant to section 3(a) of the Act by a State with parts thereof in two time zones may apply only

to all that part of the State which is in the more easterly time zone.

§ 73.7 Grant of exemption or realignment by the Secretary.

(a) A request for exemption or realignment pursuant to section 3(b) of the Act may be granted in whole or in part.

(b) An exemption will not ordinarily be granted pursuant to section 3(b) of the Act to an area if the effect would be to put that area on a time different from the time observed in all contiguous areas.

§ 73.9 Reduction in number of time zones.

No realignment of time zone limits will be granted pursuant to section 3(b) of the Act if the effect of such realignment would be to reduce the number of time zones in the United States.

§ 73.11 Restrictions on exemptions and realignments.

(a) An area exempted from the observance of advanced time or affected by a realignment pursuant to section 3(b) of the Act shall observe continuously from 2:00 a.m. Sunday, January 6, 1974, to 2:00 a.m. Sunday, April 27, 1975, the standard time applicable January 5, 1974, to the standard time zone in which the area is located. Exemptions or realignments may be revoked or modified only with the approval of the Secretary.

(b) A State may not exercise the exemption authority contained in section 3(a) of the Act in a manner which would frustrate the intent of the Act that either advanced time or non-advanced time will be observed on a year-round basis by each State.

§ 73.13 Expiration of exemptions and realignments.

Exemptions enacted pursuant to section 3(a) of the Act, and exemptions from advanced time or realignments of time zone limits granted pursuant to section 3(b) of the Act, expire contemporaneously with the expiration of the Act at 2:00 a.m. Sunday, April 27, 1975. At that time, only those exemptions enacted pursuant to section 3(a) of the Uniform Time Act of 1966, as amended, and alignments of time zone limits as they existed October 27, 1973, will be effective.

Subpart B—Procedures and Criteria

§ 73.21 Submission of proclamation of a Governor.

(a) A certified copy of a proclamation issued by the Governor of a State pursuant to section 3(b) of the Act must be forwarded to the Docket Clerk, Office of the General Counsel, TGC, Department of Transportation, 400 Seventh Street SW., Washington, D.C. 20590, and should be mailed in time to be received by 5:30 p.m. eastern standard time Friday, January 4, 1974.

(b) For proclamations transmitted by telecopier, the telephone number is Area Code 202, 426-4193. A certified copy of a proclamation transmitted in this manner shall be forwarded to the Docket Clerk in accordance with paragraph (a) of this section immediately upon completion of transmission.

(c) A proclamation must include, or be accompanied by, a statement of the claims of undue hardship or fuel conservation on which the proclamation is based, and supporting facts. Additional information may be requested by the Secretary and the proclamation should

be accompanied by the name, title, address, and telephone number of the official of the State to be contacted by the Secretary for that purpose.

§ 73.23 Decision of the Secretary.

Proclamations received in accordance with § 73.21 of this part will be acted upon as expeditiously as practicable. The decision of the Secretary will be communicated to the Governor by telegram and confirmed by letter.

§ 73.25 Criteria.

Consistent with the legislative history of section 3(b) of the Act, the Secretary's decision will be based on consideration of the appropriateness of all aspects of the exemption or realignment. This will involve, necessarily, a consideration and balancing of the objectives sought to be achieved by the Act, including:

- (1) The policy of the United States, as expressed in section 2 of the Uniform Time Act of 1966 (15 U.S.C. 260), to promote the adoption and observance of uniform time within the standard time zones of the United States.
- (2) The convenience of commerce.
- (3) Possible energy savings.
- (4) Undue hardship to large segments of the population.
- (5) Possible impact on the success of and cooperation with the national energy conservation program.

Effective date: This Part is effective December 20, 1973.

Issued in Washington, D.C., on December 19, 1973.

CLAUDE S. BRINEGAR,
Secretary of Transportation.

[FR Doc.73-27018 Filed 12-19-73; 12:49 pm]

Office of the Secretary
[OST Docket No. 34, Notice No. 74-2]

ARIZONA
Emergency Daylight Saving Time
Exemption

The Emergency Daylight Saving Time Energy Conservation Act of 1973 (December 15, 1973, Pub. Law 93-182) ("the Act") advances the standard time by one hour in all eight standard time zones of the United States continuously from 2 a.m. Sunday, January 6, 1974, to 2 a.m. Sunday, April 27, 1975, and provides that the time as so advanced shall be standard time.

Section 3(b) of the Act permits the President to grant a State an exemption from advanced time established by section 3(a) of the Act or a request for realignment of the existing limits of time zones, if the State, by proclamation of its Governor, makes a finding prior to Sunday, January 6, 1974—the effective date of the Act—that such exemption or realignment is necessary to avoid undue hardship or to conserve fuel in such State or part thereof. ("[The President's] decision should be based on the appropriateness of all aspects of any exemption, including convenience of commerce, possible energy savings, or undue hardship to large segments of the population, as well as the possible impact on the success of and cooperation with the national energy conservation program." S. Rept. No. 93-504 at 3.)

By Executive Order 11751, issued December 15, 1973, the President has designated and empowered the Secretary of Transportation to exercise the authority vested in him by section 3(b) to grant exemptions or realignments. Procedures and criteria for implementation were issued by the Secretary (49 CFR Part 73, 38 FR 34876).

The Governor of the State of Arizona, the Honorable John R. (Jack) Williams, by proclamation issued December 19, 1973, requests that the State of Arizona be exempted from observance of advanced time during the effective period of the Act.

The proclamation and supporting data submitted establish that Arizona had legislatively exempted itself from observance of advanced time under the Uniform Time Act of 1966; that the summer mean temperatures in the more populous areas of the State are such as to cause severe discomfort, and that observance of advanced time would severely increase this discomfort; that if Arizona were to observe year-round advanced time, greater power consumption would likely occur during summer months, without corresponding savings during winter months; and that much of the State's agricultural commerce with Mexico would be disrupted by observing advanced time.

Several residents of Arizona have submitted views in opposition to the Governor's proclamation. They did not, however, present specific data responsive to the criteria set forth in either the Act

or the regulations promulgated thereunder.

Upon consideration of the proclamation and supporting data, and all comments received, I find the requested exemption is consistent with the objectives sought to be achieved by the Act, and should be granted. I further find that the State of Arizona shall observe mountain nonadvanced (standard) time as standard time during the effective period of the Emergency Daylight Saving Time Energy Conservation Act of 1973.

Because of the emergency nature of the Act, the Congressional intent that it be implemented quickly; the short period of time between its enactment December 15, 1973, and its taking effect January 6, 1974; and the short period of time between the date of the proclamation—December 19, 1973—and January 6, 1974, I find that notice and public procedure on this action are contrary to the public interest and that good cause exists for making it effective in fewer than 30 days after publication in the FEDERAL REGISTER. For these same reasons it has not been possible to assess the need for, and, if necessary, to prepare an environmental impact statement on this action. See section 102, National Environmental Policy Act of 1969 (January 1, 1970, Public Law 91-190, sec. 102, 83 Stat. 853; 42 U.S.C. 4332).

This action is taken pursuant to section 3(b) of the Emergency Daylight Saving Time Energy Conservation Act of 1973 (December 15, 1973, Public Law 93-182, § 3(b), 87 Stat. 708); Executive Order 11751 (38 FR 34725); and Part 73 of the Regulations of the Office of the Secretary of Transportation (49 CFR Part 73).

Effective date. This action is effective 2 a.m. mountain nonadvanced (standard) time Sunday January 6, 1974.

Issued in Washington, D.C., on January 4, 1974.

CLAUDE S. BRINEGAR,
Secretary of Transportation.
[FR Doc. 74-765 Filed 1-9-74; 8:45 a.m.]

[OST Docket No. 34, Notice No. 74-1]

KENTUCKY

Emergency Daylight Saving Time;
Realignment

The Emergency Daylight Saving Time Energy Conservation Act of 1973 (December 15, 1973, Pub. Law 93-182) ("the Act") advances the standard time by one hour in all eight standard time zones of the United States continuously from 2 a.m. Sunday, January 6, 1974, to 2 a.m. Sunday, April 27, 1975, and provides that the time as so advanced shall be standard time.

Two classes of States are permitted to exempt themselves from advanced time: (1) Any State which is entirely within one time zone and not contiguous to any

¹ "[The Secretary] should act quickly and expeditiously. Failure to do so will risk serious inconvenience and uncertainty." See Senate Report No. 93-504 at 3.

other State (Hawaii, Puerto Rico, and the Virgin Islands); and (2) Any State with parts thereof in more than one time zone (Alaska, Florida, Idaho, Indiana, Kansas, Kentucky, Michigan, Nebraska, North Dakota, Oregon, South Dakota, Tennessee, and Texas). (Section 3(a)). If a State elects to exempt itself, the exemption must apply to the entire area of the State lying within one time zone, and the effect of the exemption must be to put the entire State on uniform time (i.e., the exemption can only apply to that part of the State in the more easterly zone) (see H. Rept. No. 93-709 at 5).

States permitted exemptions by section 3(a) may exempt themselves from advanced time anytime during the period the Act is in effect. The exemption must, however, be complete; a State may not elect to exempt itself from advanced time during winter months but observe advanced time during summer months.

Section 3(b) of the Act permits the President to grant a State an exemption from the advanced time established by section 3(a) of the Act or a request for realignment of the existing limits of time zones, if the State, by proclamation of its Governor, makes a finding prior to Sunday, January 6, 1974—the effective date of the Act—that such exemption or realignment is necessary to avoid undue hardship or to conserve fuel in such State or part thereof. ("[The President's] decision should be based on the appropriateness of all aspects of any exemption, including convenience of commerce, possible energy savings, or undue hardship to large segments of the population, as well as the possible impact on the success of and cooperation with the national energy conservation program." S. Rept. No. 93-504 at 3.)

By Executive Order 11751, issued December 15, 1973, the President has designated and empowered the Secretary of Transportation to exercise the authority vested in him by section 3(b) to grant the exemptions or realignments.

Procedures and criteria for implementation were promulgated by the Secretary (49 CFR Part 73, 38 FR 34876).

The Governor of the Commonwealth of Kentucky, the Honorable Wendell H. Ford, by proclamation issued January 3, 1974, requests the limits of the division between the eastern and central time zones in Kentucky be realigned during the effective period of the Act, to include within the central time zone all of the Commonwealth except twelve north-eastern counties (Boone, Kenton, Campbell, Grant, Pendleton, Bracken, Mason, Lewis, Greenup, Carter, Boyd, and Lawrence). The twelve counties which would remain in the eastern time zone are proximate to the Ohio and West Virginia State lines.

The proclamation and supporting data submitted by the Governor of Kentucky establish that more than 75 percent of the population of Kentucky live in the extreme western edge of the eastern time zone (as presently delineated); that observance of eastern advanced time within most of that portion of Kentucky in the eastern time zone would cause

extreme hardship to school children, agriculture, and industry requiring daylight working conditions; that the convenience of commerce would be served by western Kentucky counties observing the same time as adjacent areas in Tennessee and Indiana; and that the proposed realignment would not be detrimental to the national energy conservation program. The data submitted also establish that the twelve counties which would remain in the eastern time zone are commercially related to adjacent areas in Ohio and West Virginia, and that the convenience of commerce would best be served by their continued observance of the same time as those areas.

Although section 3(a) of the Act contemplates State legislative action to achieve an exemption from observance of advanced time within one time zone of a State with parts in more than one zone, the proposed realignment may be obtained only under section 3(b).

Upon consideration of the proclamation and supporting data, I find the requested realignment of the limits of the eastern and central time zones within Kentucky is consistent with the objectives sought to be achieved by the Act. During the effective period of the Act, therefore, the limit between the eastern and central time zones in the Commonwealth of Kentucky shall be defined as follows:

From the junction of the east line of Spencer County, Indiana, with the Indiana-Kentucky boundary northerly and easterly along that boundary to the west line of Boone County, Kentucky; thence southerly along the west line of Boone County to the north line of Grant County; thence west along the north line of Grant County to the west line of Grant County; thence southerly along the west line of Grant County to the south line of Grant County; thence easterly along the south line of Grant County to the west line of Bracken County; thence south along the west line of Bracken County to the south line of Bracken County; thence easterly along the south lines of Bracken, Mason, Lewis, and Carter Counties to the west line of Lawrence County; thence south along the west line of Lawrence County to the south line of Lawrence County; thence easterly and northerly along the south line of Lawrence County to its junction with the Kentucky-West Virginia boundary; thence southerly along the Kentucky-West Virginia boundary to the Kentucky-Tennessee boundary; thence west along the Kentucky-Tennessee boundary to its junction with the west line of Scott County, Tennessee.

Because of the emergency nature of the Act; the Congressional intent that it be implemented quickly;¹ the short period of time between its enactment December 15, 1973, and its taking effect January 6, 1974; and the short period of time between the date of the proclamation—January 3, 1974—and January 6, 1974, I find that notice and public procedure on this action are contrary to the public interest and that good cause

exists for making it effective in fewer than 30 days after publication in the *FEDERAL REGISTER*. For these same reasons it has not been possible to assess the need for, and, if necessary, to prepare an environmental impact statement on this action. See section 102, National Environmental Policy Act of 1969 (January 1, 1970, Public Law 91-190, section 102, 83 Stat. 853; 42 U.S.C. 4332).

This action is taken pursuant to section 3(b) of the Emergency Daylight Saving Time Energy Conservation Act of 1973 (December 15, 1973, Pub. Law 93-182, section 3(b), 87 Stat. 708); Executive Order 11751 (38 FR 34725); and Part 73 of the Regulations of the Office of the Secretary of Transportation (49 CFR Part 73).

Effective date. This action is effective 2 a.m. central nonadvanced (standard) time Sunday, January 6, 1974.

Issued in Washington, D.C., on January 4, 1974.

CLAUDE S. BRINEGAR,
Secretary of Transportation.

[FR Doc. 74-767 Filed 1-9-74; 8:45 am]

[OST Docket No. 34, Notice No. 74-3]

IDAHO AND OREGON Emergency Daylight Saving Time Exemptions

The Emergency Daylight Saving Time Energy Conservation Act of 1973 (December 15, 1973, Pub. Law 93-182) ("the Act") advances the standard time by one hour in all eight standard time zones of the United States continuously from 2:00 a.m. Sunday, January 6, 1974, to 2 a.m. Sunday, April 27, 1975, and provides that the time as so advanced shall be standard time.

Two classes of States are permitted to exempt themselves from advanced time: (1) any State which is entirely within one time zone and not contiguous to any other State (Hawaii, Puerto Rico, and the Virgin Islands); and (2) any State with part thereof in more than one time zone (Alaska, Florida, Idaho, Indiana, Kansas, Kentucky, Michigan, Nebraska, North Dakota, Oregon, South Dakota, Tennessee, and Texas). (Section 3(a)). If a State elects to exempt itself, the exemption must apply to the entire area of the State lying within one time zone, and the effect of the exemption must be to put the entire State on uniform time (i.e., the exemption can only apply to that part of the State in the more easterly zone) (see H. Rept. No. 93-709 at 5).

Section 3(a) permits States to exempt themselves from advanced time by law enacted anytime during the period the Act is in effect. The exemption must, however, be complete; a State may not elect to exempt itself from advanced time during winter months but observe advanced time during summer months.

Section 3(b) of the Act permits the President to grant a State an exemption from the advanced time established by section 3(a) of the Act or a request for realignment of the existing limits of time zones, if the State, by proclamation of

its Governor, makes a finding prior to Sunday, January 6, 1974—the effective date of the Act—that such exemption or realignment is necessary to avoid undue hardship to large segments of the population or part thereof. ("[The President's] decision should be based on the appropriateness of all aspects of any exemption, including convenience of commerce, possible energy savings, or undue hardship to large segments of the population, as well as the possible impact on the success of and cooperation with the national energy conservation program." S. Rept. No. 93-504 at 3.)

By Executive Order 11751, issued December 15, 1973, the President has designated and empowered the Secretary of Transportation to exercise the authority vested in him by section 3(b) to grant the exemptions or realignments.

Procedures and criteria for implementation were issued by the Secretary (49 CFR Part 73, 38 FR 34876).

The Governor of the State of Idaho, the Honorable Cecil D. Andrus, by proclamation issued December 28, 1973, requests that the entire area of Idaho located within the mountain time zone be exempted from observance of advanced time during the effective period of the Act.

The Governor of the State of Oregon, the Honorable Tom McCall, by proclamation issued January 2, 1974, requests that any determination made with respect to the mountain time zone section of Idaho apply equally to that section of Oregon which is in the mountain zone (northern Malheur County), since failure to apply any Idaho exemption to this County would create an "island" one hour ahead of all surrounding areas.

The proclamation and supporting data submitted by the Governor of Idaho establish that the State is located on the boundary between the mountain and Pacific time zones; that the northern portion of Idaho is located in the Pacific time zone and the southern portion in the mountain time zone; that permitting the requested exemption would result in observance of a single time throughout the State; that energy conservation would not occur were advanced time observed in the southern portion; that winter daylight time observance would severely disrupt outdoor industry, such as forestry, and school operations in the southern portion of the State; and that commerce would not be disrupted.

Several television broadcasting companies operating within southern Idaho state that their services would be adversely affected if the requested exemption is granted. Their network programming is received through the mountain time zone, and they note that "prime time" broadcasts would occur between 5 and 9 p.m. if advanced time is not observed, rather than between 6 and 10 p.m. if advanced time is observed. The broadcasters state that purchase and use of tape delay equipment would not be economically feasible.

Other comments have been received from several Idaho residents generally supporting or opposing the requested exemption.

¹ "[The Secretary] should act quickly and expeditiously. Failure to do will risk serious inconvenience and uncertainty." See Senate Report No. 93-504 at 3.

Upon consideration of the proclamation and supporting data, and all comments received, I find the requested exemptions with respect to Idaho, and, consequently, with respect to that portion of Oregon which is located in the mountain time zone, are consistent with the objectives sought to be achieved by the Act.

The Act, however, clearly intends that a State such as Idaho or Oregon, which has portions situated in more than one time zone, should invoke the exemption provisions set forth in section 3(a) if it desires to be exempt from the advanced time established by that section. That requires State legislative enactment of an exemption applying to that portion of the State lying in the more easterly time zone.

In recognition of the fact that the State Legislature of Idaho will not convene until January 14, 1974, and that of Oregon will not convene until February 11, 1974, I find it necessary to the convenience of commerce and to avoid confusion within the two States, to grant temporary exemptions under section 3 (b) of the Act. These will permit sufficient time for consideration and action by the respective State Legislatures under section 3(a) of the Act. The exemption granted with respect to Idaho will expire at 2 a.m. mountain nonadvanced (standard) time Sunday, February 3, 1974. The exemption with respect to Oregon will expire at 2 a.m. mountain nonadvanced (standard) time Sunday, February 24, 1974, unless the Governor of the State of Oregon requests an earlier expiration date.

Because of the emergency nature of the Act; the Congressional intent that it be implemented quickly; the short period of time between its enactment December 15, 1973, and its taking effect January 6, 1974; and the short periods of time between the dates of the proclamations—December 28, 1973, and January 2, 1974—and January 6, 1974, I find that notice and public procedure on these actions are contrary to the public interest and that good cause exists for making them effective in fewer than 30 days after publication in the *FEDERAL REGISTER*. For these same reasons it has not been possible to assess the need for, and, if necessary, to prepare environmental impact statements on these actions. See section 102, National Environmental Policy Act of 1969 (January 1, 1970, Pub. Law 91-190, section 102, 83 Stat. 853; 42 U.S.C. 4332).

This action is taken pursuant to section 3(b) of the Emergency Daylight Saving Time Energy Conservation Act of 1973 (December 15, 1973, Pub. Law 93-182, section 3(b), 87 Stat. 708); Executive Order 11751 (38 FR 34725); and Part 73 of the Regulations of the Office of the Secretary of Transportation (49 CFR Part 73).

Effective date. These actions are effective 2:00 a.m. mountain nonadvanced (standard) time Sunday, January 6, 1974.

Issued in Washington, D.C., on January 4, 1974.

CLAUDE S. BRINEGAR,
Secretary of Transportation
[FR Doc.74-786 Filed 1-9-74; 8:45 am]

U.S. DEPT. OF COMM. BIBLIOGRAPHIC DATA SHEET		1. PUBLICATION OR REPORT NO. NBS TN-649	2. Gov't Accession No.	3. Recipient's Accession No.
4. TITLE AND SUBTITLE The Standards of Time and Frequency in the U.S.A.			5. Publication Date February 1973	
			6. Performing Organization Code 273.00	
7. AUTHOR(S) James A. Barnes and G.M.R. Winkler			8. Performing Organ. Report No.	
9. PERFORMING ORGANIZATION NAME AND ADDRESS NATIONAL BUREAU OF STANDARDS DEPARTMENT OF COMMERCE Boulder, Colorado 80302			10. Project/Task/Work Unit No. 2730900	
			11. Contract/Grant No.	
12. Sponsoring Organization Name and Complete Address (Street, City, State, ZIP) Same as 9			13. Type of Report & Period Covered	
			14. Sponsoring Agency Code	
5. SUPPLEMENTARY NOTES				
16. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.) This paper describes the national responsibilities for standards of time and frequency in the U.S.A. The National Bureau of Standards (NBS) and the U. S. Naval Observatory (USNO) are the two organizations chiefly involved in distributing accurate and precise time and frequency information within the U.S.A. The NBS is responsible for the "custody, maintenance, and development of the national standards" of frequency and time (interval) as well as their dissemination to the general public. The mission of the USNO includes the "provision of accurate time" for electronic navigation systems, communication, and space technology. This is an integral part of its work concerned with the publication of ephemerides which are used in support of navigation and in the establishment of a fundamental reference system in space. Both agencies provide the U. S. contribution to the Bureau International de l'Heure (BIH) [International Time Bureau], which has the responsibility of publishing definitive values of Universal Time (UT), International Atomic Time (TAI), and Coordinated Universal Time (UTC).				
17. Key words: Astronomical time measurements; clock synchronization; clocks; Coordinated Universal Time (UTC); frequency; frequency standards; International Atomic Time (TAI); International Radio Consultative Committee (CCIR); International Scientific Radio Union (URSI); International Time Bureau (BIH); international time organizations; leap seconds; national time/frequency standards; NBS time and frequency; Precise Time and Time Interval (PTTI); time; time coordination; time interval; time scales; Treaty of the Meter (standards); U.S.A. standard time zones; USNO time and frequency.				
18. AVAILABILITY <input checked="" type="checkbox"/> Unlimited <input type="checkbox"/> For Official Distribution. Do Not Release to NTIS <input type="checkbox"/> Order From Sup. of Doc., U.S. Government Printing Office Washington, D.C. 20402, SD Cat. No. C13 <input type="checkbox"/> Order From National Technical Information Service (NTIS) Springfield, Virginia 22151			19. SECURITY CLASS (THIS REPORT) UNCLASSIFIED	21. NO. OF PAGES 91
			20. SECURITY CLASS (THIS PAGE) UNCLASSIFIED	22. Price \$1.00

NBS TECHNICAL PUBLICATIONS

PERIODICALS

JOURNAL OF RESEARCH reports National Bureau of Standards research and development in physics, mathematics, and chemistry. Comprehensive scientific papers give complete details of the work, including laboratory data, experimental procedures, and theoretical and mathematical analyses. Illustrated with photographs, drawings, and charts. Includes listings of other NBS papers as issued.

Published in two sections, available separately:

• Physics and Chemistry (Section A)

Papers of interest primarily to scientists working in these fields. This section covers a broad range of physical and chemical research, with major emphasis on standards of physical measurement, fundamental constants, and properties of matter. Issued six times a year. Annual subscription: Domestic, \$17.00; Foreign, \$21.25.

• Mathematical Sciences (Section B)

Studies and compilations designed mainly for the mathematician and theoretical physicist. Topics in mathematical statistics, theory of experiment design, numerical analysis, theoretical physics and chemistry, logical design and programming of computers and computer systems. Short numerical tables. Issued quarterly. Annual subscription: Domestic, \$9.00; Foreign, \$11.25.

DIMENSIONS, NBS

The best single source of information concerning the Bureau's measurement, research, developmental, cooperative, and publication activities, this monthly publication is designed for the layman and also for the industry-oriented individual whose daily work involves intimate contact with science and technology—for engineers, chemists, physicists, research managers, product-development managers, and company executives. Annual subscription: Domestic, \$6.50; Foreign, \$8.25.

NONPERIODICALS

Applied Mathematics Series. Mathematical tables, manuals, and studies.

Building Science Series. Research results, test methods, and performance criteria of building materials, components, systems, and structures.

Handbooks. Recommended codes of engineering and industrial practice (including safety codes) developed in cooperation with interested industries, professional organizations, and regulatory bodies.

Special Publications. Proceedings of NBS conferences, bibliographies, annual reports, wall charts, pamphlets, etc.

Monographs. Major contributions to the technical literature on various subjects related to the Bureau's scientific and technical activities.

National Standard Reference Data Series. NSRDS provides quantitative data on the physical and chemical properties of materials, compiled from the world's literature and critically evaluated.

Product Standards. Provide requirements for sizes, types, quality, and methods for testing various industrial products. These standards are developed cooperatively with interested Government and industry groups and provide the basis for common understanding of product characteristics for both buyers and sellers. Their use is voluntary.

Technical Notes. This series consists of communications and reports (covering both other-agency and NBS-sponsored work) of limited or transitory interest.

Federal Information Processing Standards Publications. This series is the official publication within the Federal Government for information on standards adopted and promulgated under the Public Law 89-306, and Bureau of the Budget Circular A-86 entitled, Standardization of Data Elements and Codes in Data Systems.

Consumer Information Series. Practical information, based on NBS research and experience, covering areas of interest to the consumer. Easily understandable language and illustrations provide useful background knowledge for shopping in today's technological marketplace.

BIBLIOGRAPHIC SUBSCRIPTION SERVICES

The following current-awareness and literature-survey bibliographies are issued periodically by the Bureau:

Cryogenic Data Center Current Awareness Service (Publications and Reports of Interest in Cryogenics).

A literature survey issued weekly. Annual subscription: Domestic, \$20.00; foreign, \$25.00.

Liquefied Natural Gas. A literature survey issued quarterly. Annual subscription: \$20.00.

Superconducting Devices and Materials. A literature survey issued quarterly. Annual subscription: \$20.00.

Send subscription orders and remittances for the preceding bibliographic services to the U.S. Department of Commerce, National Technical Information Service, Springfield, Va. 22151.

Electromagnetic Metrology Current Awareness Service (Abstracts of Selected Articles on Measurement Techniques and Standards of Electromagnetic Quantities from D-C to Millimeter-Wave Frequencies). Issued monthly. Annual subscription: \$100.00 (Special rates for multi-subscriptions). Send subscription order and remittance to the Electromagnetic Metrology Information Center, Electromagnetics Division, National Bureau of Standards, Boulder, Colo. 80302.

Order NBS publications (except Bibliographic Subscription Services) from: Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards
Washington, D.C. 20234

OFFICIAL BUSINESS

Penalty for Private Use, \$300

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM-215

